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For countless years man lived in ignorance and fear of those dread scourges which devastated armies, made plague-spots of great cities, limited populations, and halted progress.

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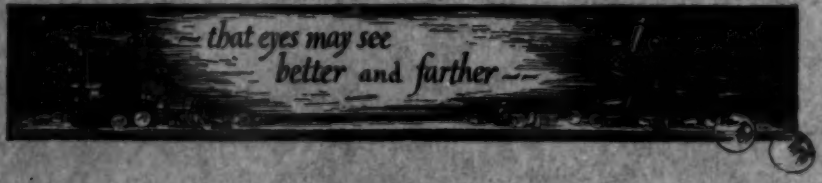

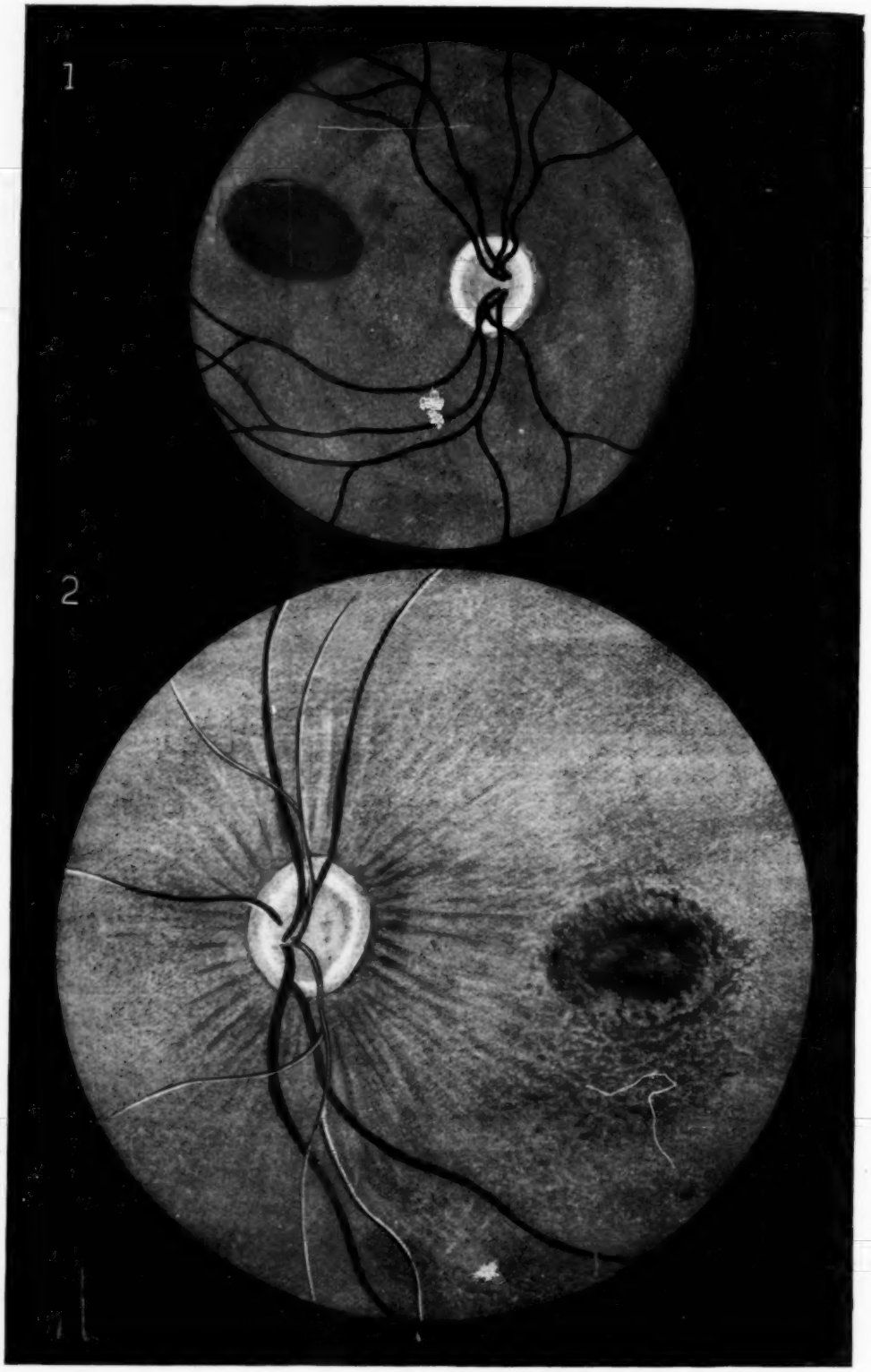

THE OCULAR FUNDUS AFTER DEATH. (WÜRDEMANN)
1. FUNDUS C. R. C. ABOUT THIRTY MINUTES AFTER DEATH.
2. FUNDUS J. E. F. ABOUT FOUR HOURS AFTER DEATH.

AMERICAN JOURNAL OF OPHTHALMOLOGY

Vol. 3 MAY, 1920 No. 5

THE FUNDUS OF THE EYE AFTER DEATH.

HARRY VANDERBILT WÜRDEMANN, M.D.,

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This paper reviews the ocular signs of death and reports especially the ophthalmoscopic changes observed in recent army service.

There has been little added to the literature of the ocular signs of death for twenty years. The chapter on the subject by Gayet,[1] is yet the standard and most complete article on the subject. Doubtless very few of the thousands of ophthalmologists in the world have had the opportunity,—and perhaps few have had the inclination,—to look into a dead man's eye for corroboration even to their own minds, of the well established signs that this organ gives of a lethal ending.

Very few cases of death occur in the actual practice of the occulist, indeed there must be many who have never signed a death certificate. In the large majority of cases the eye surgeon in attendance is not present at the time of death, nor does he see the body afterwards; as it is the usual policy to shift the onus to the general medical man in attendance. Thus it is that the only ophthalmic surgeons who have had any amount of experience in fundus examinations on the cadaver, are those connected with large institutions, particularly with teaching faculties, such as previously existed in Europe, where the economic and psychic restrictions as to the use of the body after death by medical men, are not great, as is the case in the English speaking countries.

In the 1917 volume of U. S. A. Mortality Statistics,[2] just published, of the results obtained by sending 43,876 inquiries to physicians, in 1,066,711 deaths in 1917, only 97 were given as due to diseases of the eye and adnexa. It is safe to say that aside from the question of tumors, most of these were due to diseases of the adnexa.

EXTERNAL OCULAR SIGNS OF DEATH.

It may be well at this time to call to mind certain pathognomonic stigmata, which taken as a whole, are evidence of demise; the eye signs being without doubt the most pronounced and surest of all the bodily evidences of the departure of the spirit. Shastid[3] gives a resumé which is acceptable; he states that signs of death relate to three periods: 1, the stage of transition; 2, the cadaveric state; 3, the state of putrefactive processes. Only the signs relating to the eyes, of course, concern us here, and further, even these chiefly in the state of transition.

He then goes on to refer to (1), the paleness of the skin of the lids, the partial opening where gradual dissolution occurs, except in cases where the disease causes edema as in drowning, or in death from sudden shock as in gunshot wounds, when the eyes may be staring and wide open. (2). The falling in of the globes which usually occurs as the patient is dying, and is always shown in the cadaveric state from rigor mortis, and the divergence or parallelism of the axes. (3). The insensibility of the conjunctiva and cornea and the film, or "the finely ruined eyes of death" from lymph which exudes from the ocular tissues, and the exfoliation of the anterior epithelium followed later by wrinkling of the cornea. (4), The lethal discoloration of the sclera from subjunctival ecchymosis and staining with choroidal pigment. (5) The usual dilatation of the pupils at the moment of death which is followed later by contraction from the setting in of rigor mortis. It is said that the pupil re-

sponds to eserin and atropin for about an hour after death, and may react to galvanism for five hours. All these signs are of relative importance and all are apparent without special knowledge or instruments.

THE OPHTHALMOSCOPIC SIGNS OF DEATH.

The sixth sign i. e. the appearances of the fundus at the moment of death and afterwards, is the most positive and pathognomonic, and is certainly of the most value. These appearances are indubitable, and in those cases in which the media are sufficiently clear to allow of this procedure, the expert ophthalmologist should be able to give a positive opinion as to whether or not the person is really dead, and often the length of time since his demise.

The author has had the opportunity to make fundus examinations in a dozen or more cases, and despite this gruesome task, has been interested in corroborating the observations of others. He seized this chance during his recent army service for the purpose of making ophthalmoscopic pictures, two of which, with the brief case histories, are included with this article.

We find by the ophthalmoscope that about three hours after death the media have become somewhat obscured from a lethal film, due to the exudate of albumin, and to disintegration of the corneal epithelium, whereby the mirror reflection from the cornea does not occur, and the images of Purkinje are not seen. As a rule this film forms at the time of death or shortly afterward. That on the cornea may be wiped away, and if a little fluid be put in the eye, the examination may proceed. The reflections may then be seen up to about five hours; this sign is of little consequence.

The main observations relating to the condition of the fundus are alterations, at first due to the cessation of the circulation. The most pronounced and pathognomonic sign is certainly the yellowish discoloration of the fundus, due to the slowing of the heart beat; and the heart may beat for several minutes after actual death. The fundus becomes a sickly yellow, the nerve head blanches and usually the arteries become straighter and less filled with blood.

This condition obtains for a quarter to one-half hour, when changes in the blood occur: the arteries become more empty and may even seem to disappear; and the veins are reduced to small, irregular and filamentous lines. The blood current stops altogether owing to coagulation, and shortly afterwards clear spaces filled with serum appear between the blood clots. Finally, after four or five hours, transudation of the blood pigment occurs, when the arteries are scarcely to be seen. The veins persist for a much longer time, and in fact blood may be found in them twenty-four hours after death But even here clear spaces will be seen in their lumen, and the smaller vessels cannot be distinguished. The yellowish discoloration gradually becomes dirty and then brownish-gray, due to infiltration and disorganization of the retina, which finally hides the choroid, so that if the choroidal vessels had been seen in life, they cannot be observed thru the increasing opaqueness of this membrane.

The disc likewise passes in color from a pinkish white to yellowish green and then to a slaty appearance; its edges are not well defined, all due to the want of blood in the capillary vessels and to increasing tumefaction of the tissues.

To my knowledge there is only one colored plate in the literature showing their appearance,—that of Bouchut[4]; they were so well marked in the two cases presented here, it is deemed advisable to recall them in a more modern essay.

CASE 1.—C. Chas. R., Pvt., Hdqs. Co., 44th Inf. Age 30. Service 12 mos. Admitted to Hospital Nov. 12, 1918, with measles; broncho-pneumonia; secondary otitis media R and L; mastoiditis left; mastoid operation January, 1919. Ether given, patient did not take it well. Died fifty minutes after 1st administration. Board of investigation instituted. Fundus examined thirty minutes after apparent death (1 Plate IV). The vessels are

smaller than in life. The blood has not yet coagulated so their lumina were full. The color was the same in arteries as in veins. This may be pathognomonic of death under ether. The general color is darker than in life, but not so ghostly pale as in Fig. 2, which was drawn some time after death from another subject.

CASE 2.—F., Jno. E., Pvt., 32. Co. 166 B. B. Age 29, December 26, 1918. Postmortem ophthalmoscopic picture about four hours after death with epileptiform seizure. Fundus found normal twenty hours before, altho the patient had syphilitic gumma of left anterior lobe of brain. The blood having drained from the choroidal vessels and most of the retinal vessels, the fundus is uniformly slaty gray, and the veins somewhat contracted carrying dark blood. The arteries are nearly empty, greatly reduced in size and are of the same color, where blood has adhered to their lumina. No small blood vessels are seen. The disk is discolored. The macular area shows distinctly. (See 2 Plate IV.)

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1. Gayet. Ocular Signs of Death. Norris and Oliver, System of Diseases of the Eye. v.4, p. 907.
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4. Med. Ophth. Cerebroscopy. 1876. Plate 11. Fig. 3.

OCULAR LESIONS CAUSED BY ASPHYXIATING GASES.

MARCEL DANIS, M.D.,

BRUSSELS, BELGIUM.

As Reserve Physician in the Belgian Army Dr. Danis had to study and treat the effects produced on the eye in gas warfare. This paper briefly summarizes the results of his observations. Translated by Dr. M. W. Fredrick.

I have had numerous occasions of observing the effects produced on the ocular apparatus by the socalled asphyxiating gases used by the Germans in the recent war, and to view these effects very soon after their production.

Two kinds of gas act principally upon the ocular apparatus: the tear producing and the blistering gases.

TEAR PRODUCING (LACRIMATORY) GASES.

The products most often employed are: chlorin, bromin, methyl monochlorid chloroform, or pallite, methyl bichlorid chloroform, or surpallite, acrolein, aceton bromoform, methyl aceton bromoform, benzyl bromat, benzyl iodid, phenyldichlorarsin, and diphenylchlorarsin.

SYMPTOMATOLOGY.—The effect of these different agents on the eyes is practically the same. The soldiers have a sensation of itching, or even of burning; tearing, blepharospasm and photophobia are intense, so much so in some cases that the men are incapable of finding their way about unaided. Under these conditions the wearing of the antigas mask is almost impossible. The bulbar and palpebral conjunctivae are strongly hyperemic, but there is no ciliary injection, and corneal lesions have never been observed.

These symptoms present themselves immediately after the gas attack, and disappear within a few days, leaving no traces.

PROGNOSIS.—As far as the eye is concerned the lesions produced by lacrimatory gases are benign.

BLISTERING GASES.

The blistering gas most often used is the "mustard gas," so called on account of its odor, or Yperite; because it was used by the Germans for the first time in the Ypres sector. This gas is dichlorethylsulphid, a liquid with a high boiling point, which is used in projectiles only. The liquid may come in direct contact with the soldier

immediately after the explosion of the shell, or it may reach him later on by contact, or by evaporation from the ground, clothing, the trenches, the shelters, or shell holes.

SYMPTOMATOLOGY.—There are no immediate consequences, but in five or six hours after exposure the first eye symptoms appear, and attain their height eighteen to thirty-six hours later. The lesions consist of conjunctival and ciliary injection, which always precedes the blepharospasm and photophobia. These two latter symptoms may be so violent as to preclude the examination of the ocular globe. This hyperemia is, in the beginning, localised in the parts normally exposed to the air thru the lid aperture.

Often the corneal epithelium shows a slight lesion in the region corresponding to the lid aperture. This lesion is so slight in some cases that an examination with fluorescein and the loupe are necessary to discover it. In other cases the cornea presents a general clouding. Deep and extensive ulcers have been reported, but I have never seen them. The ciliary injection occurs very often, and in these cases there is contraction of the pupil. This ciliary injection is a concomitant of the corneal lesions.

The conjunctival secretion may appear after several days and be rather profuse, but it never contains any microbial elements. The examination of the fundus is rendered difficult by the blepharospasm and photophobia. But in those cases which I was able to examine I have never found any lesions of the deeper parts or of the media.

Burns of the eyelids may occur just as burns of other parts of the body. These burns are generally found on those parts of the body which are normally moist: axilla, genital organs, eyelids moistened by tears, etc.; they are mostly of the first or second degree.

Altho not serious these lesions are difficult of management and slow in healing; as an average two months are required to effect a cure.

PROGNOSIS.—Generally speaking the prognosis in burns by Yperite is benign. A serious complication is corneal ulceration followed by nebula or leucoma.

TREATMENT.—It has been recommended that at the dressing stations the eyes be flooded with a solution of potassium permanganat. But this is a difficult procedure on the first or second line; and those who have advised this have never witnessed the work of a battalion doctor during action, when the station is crowded with wounded and gassed soldiers.

The instillation of one or two drops of an alkalin solution, for instance of a two per cent solution of sodium bicarbonat, is easily done; and is more aseptic and more effective because it penetrates better into the conjunctival folds. In the division hospital to which I was attached the wounded were received and put in darkened places, and another instillation of an alkalin solution was made. To prevent conjunctival infections, generous washing of the eyes with one quarter of one per cent of potassium permanganat was practised several times a day. For pain cocain and adrenalin drops were used five or six times a day, and atropin was used to overcome the congestion of the iris. When the blepharospasm had disappeared smoked glasses were worn. Astringent collyria, such as zinc, tannin, nitrat of silver, are to be avoided. In corneal desquamation the indications are the use of atropin and of a cicatrising ointment, such as biniodothymol. As to the burns of the eyelids they are to be treated according to the usual methods.

PROPHYLAXIS.—All the masks in actual use in the Belgian army (M 2, A.R.S., and Tissot), if well applied, completely protected the eyes against the vesicating action of Yperite.

REMOVAL OF STEEL FROM THE EYE FROM AN INDUSTRIAL STANDPOINT.

C. A. CLAPP, M.D.,

BALTIMORE, MD.

This series of recent cases of magnet extraction and alternative treatment was read and discussed before the Section on Ophthalmology and Otology of the Baltimore City Medical Society. See page 137.

It is not my intention in bringing this subject before you to advocate anything new or startling but to add our bit of testimony, and to record some of our viewpoints which have changed somewhat since the subject was last discussed before this Section; and secondly to try to prove that this is not a hopeless condition as I have heard some of my colleagues express the opinion rather recently.

It is interesting in reviewing the history to find that Dixon of London in 1859 drew a fragment of scissors from the vitreous to an incision in the sclerotic, then removed it by forceps. This was followed by McKeown in 1874, and Hirschberg in 1877 who used the electromagnet, consisting of a soft iron bar wrapped with copper wire. Haab presented his giant magnet in 1892, it being the largest and most powerful at that time.

In this country Gruening, Hubbell, Johnson, Lippincott, Sweet, Parker and others have devised magnets. Williams, of Boston, was the first to use the X-ray for diagnosis and localization in 1896.

The chief point in discussion at the present time seems to be as to the relative desirability of using the anterior method of extraction, as advocated by Haab; or the posterior route as championed by Sweet, de Schweinitz and others. Our experience up until a few years ago made us rather favor the anterior method, more recently it has changed somewhat, and relatively speaking I would prefer the posterior route. Of course, there can be no hard and fast rule, but all cases are to be handled individually; and in case of recent injury, with the F.B. in close proximity to, or even in the wound of entrance, immediate extraction thru the wound is preferable.

As shown by the table, several of these cases are of considerable interest; as in Case 29, the very large size of F.B., 9 × 5 × 2 mm. Its location in the ciliary region, and the extraction thru the wound, and good visual result, 20/20.

Case 13 was diagnosed chiefly by a small point of siderosis, and confirmed by X-ray. Extracted after three years, and after removal of cataract V. = 20/50.

Case 9, with 3/200 V. and getting worse, improved to 20/20, without cataract.

Case 8, injury unknown, negative to X-ray. Minute F.B. 1× ½ × ½ mm. 20/20 vision with + 13.00 sphere.

4 cases had normal vision = 14%.

6 aphakic eyes, with V. 20/50 to 20/20 = 21%.

10 useful vision = 35%.

7 light perception to motion = 24%.

11 eyes lost =38%.

1 vision not tabulated.

This compares very favorably with Bull's report in 1902 of eighteen cases without a single case of useful vision; and comparatively well with Sweet's last series which showed useful vision in 24% of the cases and 51% lost eyes.

Seven cases were operated on by the posterior route, five cases retaining useful vision, or 71%.

Sixteen times the injury occurred in the right eye, and twelve times in the left.

Average size of F.B. was 4.8 × 2 × 1 mm.

Largest was 20 × 5 × 4 mm.

Smallest 1 × ½ × ½ mm.

Average age 34.

Youngest 17.

Oldest 53.

While this series is not large I believe it demonstrates that at least not all of these cases are hopeless, and that

TABLE OF CASES.

No.	Age	Date	Injury	Operation.	Result.	Size.
(1) A. E.	34	4/23/19	R. Injury 4/8/19. Scar nasal side of cornea. Hole in iris, F. B. on post surface below nerve, with oph. V=20/70.	Incision between internal and inferior rectus. Magnet.	5/4/19 V=20/50 Opacity in lens. 5/17/19 V=20/200	1x¾x½ mm.
(2) H. H.		10/4/14	L. No history of wound. Has only one eye.	Magnet.	Panophthalmitis. Lost eye.	Large. 10x4x2 mm.
(3) C. J.	28		R. Wound near center of cornea. Cut of sphincter of iris.	Post. incision between superior and External rectus. Magnet.	Traumatic cataract. Absorbing.	¾x½x¼ mm.
(4) J. K.		9/15/13	L. Wound in sclerotic Hyphemia.	Enlargment of incision opening; Anterior Chamber. Magnet.	No tabulation.	12x2x1 mm.
(5) G. K.	19	11/13/14	R. Cut of Cornea.	Magnet over wound. Iridectomy.	Cataract needling. No. V. result recorded.	6x1½x½ mm.
(6) W. T. M.	38	3/28/16	L. Cut of cornea, prolapsed iris. Cataract.	Magnet over wound. Iridectomy.	Pthisis Bulbi.	7x3x1½ mm.
(7) E. F. F.	28	5/8/16	Injury 5/13/16. Seen 5/18/16, scar at temporal margin. R. cornea.	Post. incision Ext. and Sup. rectus. Magnet.	Steel removed 3/19/18. Traumatic cataract needled. V=R s. + 12. ⌒ 1. cyl. ax. 90°=20/20—	4½x1x½ mm.
(8) H. C. C.	21	7/28/19	L. Steel in lens, macula of cornea. X-ray negative.	Spade knife Magnet. Removed lens.	L. + 13.00—20/20.	1x½x½ mm.
(9) C. C. S.	47	7/6/18	R. Injured 6/25/19; seen first 7/6/18. Said to have been advised to leave alone. V=3/200.	Post. incision between Inf. and Ext. rectus. Magnet extraction.	Vitreous opacities absorbed. V 8/8/18=20/20.	2x1x½ mm.
(10) L. E. C.	37	4/3/11	L. Wound in lower temporal quadrant cornea. Steel in lens.	Magnet extraction through wound.	Irido-cyclitis.	7x1½x½ mm.
(11) N. O. D.	33	12/28/17	R. Injured 10/9/17. Eye painful. 12/23/17 pus in ant. chamber.	Post. extraction incision between Ext. and Inf. rectus.	Eye continued painful and was enucleated.	Small.
(12) J. F.	38	11/13/18	L. O. S. Wound of cornea and iris.	Magnet applied over injury. No results. Incision between Ext. and Inf. recti; removed.	Irido-cyclitis. Enucleation.	3x2x1 mm.
(13) B. M.	23	6/18/15	R. Injury three years previous. Macula cornea; traumatic cataract; F. B. vitreous.	Post. incision, Ext. and Inf. rectus; magnet extraction; extracted cataract.	V=s. + 12.00 = 10/200. 2/1/18 V=+12.00 =20/50—	2x1½x1 mm.
(14) J. B.	35	10/10/15	L. Wound temporal limbus; prolapse of iris; hyphemia; vitreous humor. V=Motion	Magnet extraction from iridectomy.	Irido-cyclitis. Enucleation.	2½x2x1 mm.
(15) J. L.		4/21/19	R. Steel imbedded in sclerotic between Ext. and Inf. rectus.	Removed with forceps; some loss of vitreous.	V=20/15	5x1x½ mm.
(16) L. R.	28	8/2/19	L. Center of cornea. F. B. in vitreous.	Cornea incision, iridectomy, magnet extraction.	Traumatic cataract extraction. V= +10 ⌒ +3.00 cyl. ax. 160° = 20/40++	2½x1½x½ mm.
(17) B. S. J. L.	46	3/15/18	R. Lower outer quadrant cornea. Cut of iris. Steel in vitreous.	Corneal incision, extraction with magnet. Traumatic cataract.	Refused operation. V=L. P.	3x1½x1 mm.
(18) J. A.	?	4/23/18	Steel in anterior chamber. R. on iris, lower nasal quadrant.	Corneal incision, magnet. No iridectomy.	Little reaction. Did not see after leaving hospital.	1x½x½ mm.
(19) J. C.	17	6/13/13	R. One mm. from limbus in cornea on temporal side. Hole in iris. F. B. seen in vitreous.	Magnet, original opening.	6/30/13 V= +1.50 ⌒ +0.50 cyl. ax. 180° =20/30. 12/3/13 V=2/200 Needled lens, 11/14/14 V +12.00 = 20/20—	3¼x2¼x¾ mm.
(20)		3/24/05	Steel in vitreous.	Magnet.	Lost eye.	20x5x4 mm.

No.	Age	Date	Injury	Operation.	Result.	Size.
(21) G. R.	32	12/22/15	L. Wound of cornea; cut of iris. X-ray F. B. in sclerotic.	Repeated magnet.	Lost eye.	4x3x1 mm.
(22) E. W.	51	3/19/17	Macula, L. cornea and iris, cataract. X-ray shows shadow.	Extracted lens. Tried magnet; no result.	X-ray shows no shadow. V= +4.00 $\bigcirc$ +10.00 cyl. ax. 25° =20/50.	
(23) B. W.	24		L. Wound nasal side of sclera. Lens cloudy. steel removed by Dr. McConachie.	Removed lens. Eye lost.	F. B. embedded in sclerotic.	2x2x1 mm.
(24) L. T.	53	7/14/05	R. Wound nasal side of sclera. Lens cloudy. steel removed by Dr. McConachie.	Removed lens. Eye lost.	Enucleation.	
(25) C. G. S.	36	8/1/19	L. Wound of cornea and sclerotic.	Extraction thru wound.	Irido-cyclitis. Motion.	10x3x4 mm.
(26) P. M.	30	8/23/19	L.	Post. magnet. Ext. and Inf. rectus.	Motion, vitreous, cloudy.	3x2x1 mm.
(27) M. P.	38	1/21/18	R. Center of cornea, cut, cataract.	Repeated magnet, with negative results.	Cataract needling. Light perception.	
(28) G. W.	20	4/15/17	R. Wound of iris above with F. B. in wound.	Incision of cornea. Small iridectomy.	V=20/30	3½x1x½ mm.
(29) A. B.	49	5/23/18	R. O. D. One mm. from limbus in cornea on temp. side. Hole in iris; F. B. seen in vitreous.	Magnet incision of ciliary body. Conj. suture.	V = c +0.75 cyl. ax. 90° = 20/20, 9/23/18.	9x5x2 mm.

an attempt should be made to remove every particle of steel if it is lodged within the eyeball. If the eye is lost we advise enucleation, and especially so if the eye still harbors a foreign body.

We are aware that Col. Lister established very definite rules for extraction by the anterior route, for those cases occurring in the B.E.F.; but certainly our cases of posterior extraction were more satisfactory than those removed by the anterior route, and in none of our cases did we experience the troublesome detachments reported by some. On the other hand this class of cases can not be handled dogmatically, but each case should be carefully studied with the exercise of one's best surgical judgment.

FUNGUS CONCRETION IN LACRIMAL CANALICULUS (STREPTOTHRICOSIS, ACTINOMYCOSIS.)

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One of these rare cases is here reported with review of the previous literature and the difficulties of cultivating and classifying the fungus in question. Read by invitation before the Pacific Coast Oto-Ophthalmic Society, August 5th, 1919.

There are probably some 70 odd cases recorded in the literature of concretion in the lacrimal canaliculi. Only four of these, so far as I have been able to ascertain, belong to North America, all the rest to Europe. In over ten years of clinical work as instructor in the University of California Medical Department, no instance of this condition was met with. Shortly afterwards I came upon the case here reported.

A woman of 40 years presented herself, October, 1912, for a smooth, half rounded, cylindriceddish, resistant, painless prominence, the size of a small bean; about 3.75 by 1.75 mm., situated over the central portion of the course of one lower canaliculus. There is no discharge from the corresponding punctum on pressure. The affection, of slow continuous growth, has been noticed for more than a year. Patient

has had eye drops prescribed for it by several men. To any one having knowledge of organic concretions occurring in the canaliculi the very presence of the little lump is suggestive.

By slitting the canaliculus in the usual manner with a Weber's knife, a dirty, dark greenish, slightly moist, coherent and nonadherent mass was easily removed therefrom in toto; the canaliculus being there somewhat dilated. The incision healed promptly. The small irregularly rounded substance, the size of a small pea, was easily broken up, by slight pressure between the fingers, into several polygonal bodies with smooth facets after the manner of gall stones. Smears from these proved negative regarding bacteria. Unfortunately, no suitable media being obtainable, cultures were not made. Under the microscope the matter showed a dense uniform network of long mycelial growths, with branches and often enlarged endings. Diagnosis—streptothrix.

I here subjoin the report of Dr. Ernst A. Victors, to whom a large part of the mass had been handed: "Plug from canaliculus, made up of a mass of mycelial network in homogeneous matrix, these are in true branches and end in enlarged extremities rather than in hyphae. Gram positive. No sporangium present, and endoplasm contains spores. Endoplasm encased in tubular sheath. This is not septate. Diagnosis,—mold, of the Hyphomyceta family. Type, streptothrix. I have not been able to make out subclassification, but it is probably bovis communis (actinomycosis)."

Dr. Victor's and my judgment are then agreed on the character of the mold as belonging to streptothrix. The importance of making cultures, however, will become sufficiently apparent, I hope, further on.

The earlier records of this condition are by Cesoni (1670), Sanifors (1779) and Desmarres (1842). It was von Graefe (1) who in 1854, first recognized the organic nature of the mass and who drew a classical picture of its clinical appearance based on ten cases of his own. This description has been added to since, but has not been altered in the main.

The affection has been met with more commonly in women and, with eleven exceptions, only in the lower canaliculus. The theory of being an occupational disease (agriculture) has not become definitely established. Koster, (2) whose report in 1916 on three cases, all in women, and which I believe, is the latest in the literature, also states expressly that none of these patients had ever followed an occupation supposed to render one prone to the disease. Of the mode of its beginning we have no knowledge. Von Graefe observed that the concretions are apt to be denser and smoother toward the punctum, also being there of a darker and more uniform color, i. e. from a dark gray yellow to greenish as against a brighter varying yellow farther away. From this, he argues, we may perhaps conclude that the spores enter from the conjunctiva and the parts nearest the punctum are the oldest. The supposition that the mold is carried upon or preceded by an awn of grain, etc., which, by lodging in the canaliculus or by vulnerating its wall, would establish the beginning of the concretion, has never been proven. Goldzieher (3) has found in one instance an "eyelash in the midst of the concretion, and Schroeder (4) raises the question whether after all, this might not have been an awn. It certainly is remarkable that the spores, if merely sucked into the punctum by themselves, should not be washed out of the canaliculus with the normal flow of tear fluid.

Further, it is very striking that tho the mucous membrane of the inflamed canaliculus is much stretched, its continuity is quite intact and the mass not adherent to its surroundings. There is only one single case recorded in which a loose connection with the walls could be demonstrated (Schroeder, 4).

It is well here to mention the history (Mitvalsky, 5) of a woman, age 65, who having suffered repeatedly from a relapsing dacryophlegmon of both sides with fistula, presented herself with new swelling of left tear sac of

some months' duration. Mitvalsky removed from the sac a dark greenish mass of about almond size. Diagnosis, actinomycosis.

We read in one history (Blessig, 6) that the growth was observed in the course of a peculiar conjunctivitis with milky, sticky secretion, first in one canaliculus, and some months later, after an apparent complete cure, in the other canaliculus of the same eye. The author believes, therefore, that the spores enter from the conjunctiva. Unfortunately, he does not state whether there were any suspicious mycelia, etc., in the conjunctival secretion. There is yet another history (Kastalsky, 7) where, after removal of a concretion from a lower canaliculus, a new one was found after 20 months in the upper of the same eye. In one single instance (Snegirev, 8) concretions were found in all four canaliculi at the same time.

The growth, clinically observed as large as a hazel-nut, but generally much smaller, does not necessarily obliterate the continuity of the canal completely, and it may be possible to wash fluid thru the tear passage from the canaliculus. According to von Graefe, one may be able to palpate along the canaliculus an induration occupying the thickness of the lid, nearly cylindric, solid and but moderately compressible. Anatomically the contents may be found to consist of several bodies instead of but a single one. Accompanying symptoms in the earlier stages are irritation in the neighborhood, such as reddening of caruncle, lower plica semilunaris, canaliculus and conjunctiva covering lid margin, and subjectively those of an angular catarrh, and later a slight partial ectropium and blennorrhea of the canaliculus with marked irritative swelling of adjacent parts. It is only within more recent years that in two instances, for the first time, purulent ulcerous affections of the contiguous tissues have been observed.

In the one case (Zur Nedden, 9) a chalazion-like prominency on the lower lid presented itself, on eversion, as semispherical with pus shining thru in parts. In introducing a Weber's knife into the canaliculus resistance was met with so that the resulting slitting was but incomplete. It was found that the canaliculus was in communication with the purulent thickening of the lower lid. After the incision a small quantity of whitish thick pus escaped containing small granular concretions. The rest was easily scraped off. Healing was complete in 8 days. The aerobic culture yielded a streptothrix species.

The second case (Chesneau, 10) is that of a swelling 7 by 4 mm. in the lower lid touching the upper lid and being ulcerated there. Edges of the ulcer were sharp and of vivid red, its floor granulating and of dirty yellow color. After slitting of the canaliculus into the ulcer, a cavity showed containing an atheromatous mass amidst bloody pus. The walls of the emptied cavity appeared irregularly swollen and bleeding easily. There was prompt healing. Examination of the atheromatous material showed actinomyces hyphae. Cultures unfortunately miscarried.

Whilst in the former case a streptothrix proved less harmless than the whole group has heretofore been looked upon—the actinomyces in the second case (even supposing, without a culture, it to be actinomyc. hominis s. bovis), as certainly proved not nearly so destructive as in other localities.

In this connection we must mention that it has been claimed in supposed cases of actinomycosis bovis that the reason the growth does not penetrate the wall of the canaliculus is that it lies within an epithelial canal and is surrounded by tear fluid, the latter being of low nutritive value. It has also been stated by Robert (11) that actinomycosis may take a mild course in other parts, more especially the tongue, nose and pharynx. Furthermore, there is a history in Italian literature by Majocchi (12) of a concretion in the duct of Wharton which resembled our concretion. The surrounding tissues had not been invaded. Unfortunately, Majocchi's argumentation for acti-

nomycosis in his case is not very convincing.

Clinically, from the differential diagnostic standpoint, it is to be noted that only very exceptionally other simulating foreign bodies are found in the canaliculi. Mitvalsky (5) had in one case a copious framework of wheat starch granules. This, then, was a case of pure foreign body inflammation. In another case of the same author's, there was found fatty detritus only. Mitvalsky does consider it not impossible, however, that here molds had been present formerly, and had perished. Axenfeld has seen syphilis of the canaliculus show the same appearance as fungus concretion.

As already alluded to, the concretion becomes darker and brown in course of time, and such ones are harder and less easily removed. In some cases calcification occurs. The mass of mold seems finally to die, when we have a calcareous body surrounded by debris. The microscopic examination by Capellini (13) of these later stages is of special interest. It is summarized by Axenfeld as follows: "The concretions contained calcium monophosphat and carbonat. In the sections a dendritic net-like structure was very evidently produced by radially arranged needle shaped crystals. The most peripheral layers of the individual crystalline masses were stained dark brown. The streptothrix elements were no longer visible; still the concretion had probably developed on such an organic basis."

It seems to be a safe conclusion to assume the dacyroliths of former times were nothing but fungus concretions of the various stages.

Whether there is a spontaneous cure we do not know, since all cases reported have been operated on by slitting of the canaliculus. Eversbusch (14) succeeded in preserving the canaliculus in the following way: Gradual dilatation of the lower canaliculus with differently sized probes was followed by syringing of the upper canaliculus with sublimat 1:10,000 aq. dest. et glycerin. aa, with gradually increasing pressure of piston. The fluid leaving by the lower punctum helped to loosen the concretion which was located near the exit into the sac. By pressing upon the tear-sac and adjacent parts of the lower canaliculus from without thru the skin and from within from the conjunctiva with two Daviel's spoons, the whole contents were squeezed out by way of the lower punctum. After a further syringing Eversbusch carefully cauterized the depth of the cavity with silver nitrat fused to the point of the conical probe.

The greatest interest attaches to the classification of the mold. This will be realized at once from the statement that in one case at least, the fairly conclusive bacteriologic proof has been given, that in a case clinically not differing in the least from the customary picture, actinomyces bovis really seems to have been the pathogenic organism. On the strength of that result, the problem immediately faces us,—why should true actinomycosis in this locality prove so perfectly harmless an occurrence, as against its destructiveness in general surgery? The mere fact of its being in an epithelial canal would hardly seem to offer a sufficient explanation. The fact, then, of a highly pathogenic organism eventually forming intra vitam, a macroscopically sharply defined body, that thruout its existence remains detached from its host, offers, without a doubt, a wonderfully fascinating biologic problem.

It will be possible to take up but briefly the histologic and bacteriologic aspects of the subject. For a classical exposé of the whole matter those interested may be referred to Axenfeld's Bacteriology.

After having been looked upon at first as favus by von Graefe and as leptothrix by Cohnheim, Leber and Waldeyer, and also Graefe later on, Cohn's designation as streptothrix Foersteri (in honor of the late Breslau ophthalmologist) had become the name most used in statistics up to 1894. In that year von Schroeder (15) published his findings as actinomycosis, primarily on account of the ray formation present in the typical globular refractile bodies met with in his two

cases. It must be conceded that the diagnosis of actinomycosis was made here with as much justification as is the case with the general surgeon to whom the microscopic picture is likewise all sufficient, without having recourse to the difficult culture.

Schroeder's communication attracted general attention and a number of cases were thereafter likewise reported as actinomycosis. There has long been a general agreement that actinomyces hominis s. bovis belongs to the streptothrices, all of which are characterized by their polymorphism. Ray formation may be met with in any of them, but their pathogenicity is very much at variance. If it is preferred to call all ray fungi actinomyces, actinomyces hominis s. bovis then is one species, and streptothrix another, or rather likely several others, and we may in that sense call the affection actinomycosis.

It would appear more practical, however, to adhere for the present to the term streptothricosis, since Silberschmidt (16) in 1900, first succeeded by exact culture and experimental work in establishing streptothrices as the cause of the concretions in his cases. The same organism was found conclusively by Axenfeld and Cohn (17). As against these Auerbach (18) in 1902 had positive results in animal experimentation as regards "typical actinomycotic growths." Even in the face of these findings, however, the problem still remains unsolved as to why the clinical picture in this case entirely failed to offer any similarity to true actinomycosis.

In conclusion, let me say that cultures are very difficult to grow. One reason is the great number of other organisms generally present; whilst at the same time streptothrices grow very slowly, as an analogue to the closely related mycobacterium tuberculosis. Axenfeld recommends, therefore, to resort to anerobic cultivation whereby one frequently would succeed in killing off the accidental organisms. He also recommends acid media. Finally, the age of the concretion tends to militate against success.

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CARCINOMA OF ORBIT PROBABLY ORIGINATING IN THE LACRIMAL GLAND.

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The case here reported recurred after excision of the tumor. But there had been no second recurrence more than four years after evisceration of the orbit. A brief account of the literature of such tumors is given. Read before the Indiana Academy of Ophthalmology and Oto-Laryngology, May, 1919.

I append to this report a bibliography of over forty articles written in our own and other languages covering most of the recent literature on the subject of tumors of the lacrimal gland. It must be freely confessed that I have, for the most part, read them simply by title. But I trust they will enable someone to discover additional facts, for which he may be in search along these lines.

The gist of the matter is that tumor of the lacrimal gland is not very common, and that carcinomata form but a small percentage of those cases that do occur. For instance, in 1868 Polaillon, in his article "Pathology of the Lacrimal Gland," reviewing eighteen cases of tumor of the lacrimal gland, notes that only one was a carcinoma. Then, again, Schaeffer collected 128 cases of tumor of the lacrimal gland, going back into ancient literature for thirty of them. Of his 128 only 12 were carcinomata. Kirkpatrick reports a case of carcinoma of the lacrimal gland. He makes this direct statement: "Carcinoma of the lacrimal gland being of rare occurrence I thought it sufficiently interesting to place on record."

Elliot and Ingram report six cases of lacrimal tumor studied by them in India. They state that two of them were endothelioma; two sarcoma; one was not examined; and the last was thought by the pathologists to be a syphilitic gumma: it clinically appeared to be distinctly malignant.

CASE.

The history of the case which I wish to report is as follows: I first saw Mrs. P. M. on December 15, 1913, when she came to me to be refracted. In doing this both eyes were given the usual general and ophthalmoscopic examination, such as I outlined in a paper I read before the State Society a few years ago. Nothing abnormal was noted except compound hyperopic astigmatism in each eye. She was also presbyopic, being fifty-nine years of age.

Vision: O.D. 20/95 with lens 20/40. O.S. 20/130 with lens 20/60.

About five months later (on May 6, 1914) patient reported again, saying that for the last two months she had noticed a growth in the left eye. This proved to be a small mass in the upper and outer angle of the orbit. As time went on this mass grew steadily larger and was painful. It restricted full movement of the eye to the left.

On July 24, 1914, I operated, aiming to remove all or as much of the tumor as possible without disturbing the eye itself, as the fundus was negative and the vision was as good as when I prescribed glasses for her in December, 1913. The mass was found to extend backward about ½ to ⅔ the depth of the ball, and to be somewhat adherent to it. It lay between the ball and the outer wall of the orbit.

I sent the specimen to Dr. W. D. Gatch, of Indianapolis, for pathologic report and received the following reply from him: "A microscopic section of the tissue which you sent us July 24th, shows that the tumor consists of cells which have nuclei of various shapes, some oblong, some spherical and some irregular. The nuclei also vary in their staining properties. Some take the hematoxylin lightly, some are pyknotic. The interstitial substance consists, for the most part, of a myxomatous material which stains a light blue and takes the eosin poorly. In other places the stroma is fibrous. The

term fibro-myxo-sarcoma, I believe describes the growth. From the history of the case, and the microscopic picture, I regard the tumor as malignant.

"We prepared sections of all the little pieces sent us and some of the smaller show a well defined connective tissue capsule which merges into a myxomatous tissue and this ends abruptly in the cellular tissue which I have described above. I would not be willing to hazard an opinion as to the degree of malignancy. The myxomatous changes would point to a low grade. But on the other hand the tumor is so cellular, and the nuclei vary so much in their staining properties, that if one regarded this part of the section alone he would think the tumor very malignant."

The pain was relieved by the operation, and the necessary canthotomy wound healed nicely. The patient was now given X-ray treatment over the area from which the mass had been removed.

On November 12, 1914, there was noticed a slight return of the growth in the same region. This was about four months after operation. By the early part of December the growth was increasing rapidly. Vision in this affected left eye remained at 20/130 but could not now be improved by a lens as heretofore, altho I could discern no fundus changes.

In view of the microscopic findings in the specimen already removed, and the rapid growth of the returning tumor, it seemed best to do a radical exenteration of the orbit. This I did under date of December 15, 1914. The malignant mass was removed along with the eye ball and the other orbital contents. Care was taken not to cut into the tumor itself. It was, however, adherent to the periosteum of the outer orbital wall. The outer 2/5th of each lid was sacrificed. Practically a new lid was made for this portion by sliding forward the temporal flap—a plastic scheme suggested by Dr. Bulson who had seen the patient with me sometime previously.

After exenteration I cauterized the entire orbit with the actual cautery. In closing the wound, the region of the outer canthus was not only cauterized but some of the flesh down to the periosteum of the temple in this region was clipped off. The tumor measured roughly about 20 mm. vertically and 13 mm. anteroposteriorly.

The whole orbital mass was sent to Dr. Gatch who reported under date of December 22, 1914, as follows: "The tissue was much better fixed in this specimen than in the former one and I have compared sections from the two growths.

"The present section has all the appearance of a carcinoma. The cells are epithelioid in appearance and are in many places arranged in alveoli. The cells produce considerable mucous or myxomatous tissue. In other places the alveolar arrangement is entirely wanting and the cells look like the more cellular portions of the former growth, and a careful study of the former growth shows that the cells have probably been shaken out in places from their aveoli in the process of preparation. This probably deceived me as to the precise character of the growth. The growth is situated on the outer part of the eye and its character would suggest a carcinoma, probably originating in the lacrimal gland. A section from the opposite side of the eye shows no growth and gross examination of the orbital tissue reveals no growth. The eyeball itself is entirely uninvolved but the growth was slightly adherent to the sclera."

The operation was done four years and five months ago, that is, in December, 1914. There is no indication of a return of the growth.

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LANTERN AND APPARATUS FOR TESTING THE LIGHT SENSE AND FOR DETERMINING ACUITY AT LOW ILLUMINATIONS.

PROF. C. E. FERREE AND G. RAND, PH. D.,

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The apparatus here described, along with the method of using it, furnishes a practical test of light sense and adaptation by the use of the ordinary test cards under accurately known and graded illumination. It seems possible to use a lantern of this kind for ordinary clinical work. Read before the American Ophthalmological Society, June, 1919.

The incentive to this work was a request by the Naval authorities for an apparatus suitable for a quick and accurate test of acuity at low illuminations. Experience of the trial and error sort has shown, roughly speaking, that only 20-25 per cent of the men on the battleships have a sufficiently keen acuity of vision at low illuminations to qualify for all branches of the lookout and signal service work. This request came thru Commander G. B. Trible of the U. S. Naval Hospital at Washington. The apparatus is now in use at the Naval Hospital.

An apparatus has been devised by means of which a wide range of illuminations (beginning at 0.07 metercandles or lower) may be covered in just noticeably different steps; with no change in the color value of the light; and with a specification at each point of the intensity of light falling on the test object. The apparatus will be described here; and results will be given in a second paper covering the following points: (1) The range of minimum illumination required by a number of normal eyes for the discrimination of certain standard test objects. (2) Individual variations in the amount and rate of adaptation to low illumination in terms of the effect on acuity; and (3) sensitivity of the acuity test, when applied at the minimum illumination at which the test object can just be discriminated, for the detection of small errors in refraction and in their correction.

THE APPARATUS.

Among the requirements for an apparatus for determining acuity at low illuminations, or the effect of change of illumination, the following points may be mentioned: (1) A means of changing the illumination by small amounts over a wide range, beginning at or below the threshold for the test object employed, without changing the color value of the light. If in making this change the color value of the light is altered, it is obvious that another factor affecting the results is introduced. (2) A means of keeping constant for an indefinite length of time any desired intensity of illumination and of reproducing this intensity at will; also the test object must be uniformly illuminated. (3) A means of specifying accurately, at any point in the scale, the intensity of light falling on the test object; and (4) it is desirable that the apparatus employed for controlling the illumination can be used with the test objects already accepted in clinic practice.

The most difficult problem one has

to face in constructing an apparatus for determining the minimum amount of light that permits of the discrimination of a given test object, more particularly if that object consists of a line of test letters, is to secure a uniform illumination of the line. This problem is relatively unimportant at the illuminations ordinarily used in acuity testing because at these illuminations acuity changes so slowly with change of intensity of light that the differences which may occur thruout the line of test letters do not ordinarily produce a detectable effect on the results of the test. But if no more care is exercised at the threshold to secure uniformity of illumination than is ordinarily used at the higher illuminations, no single intensity at the source will serve for the discrimination of all the letters of the line.

We were able satisfactorily to meet this difficulty in only one way, namely, by selecting an aperture sufficiently small to permit of its uniform illumination, and of projecting the magnified image of this aperture on the test card. That is, an aperture was selected of such a size and shape that when magnified five-fold it gave a band of light which just blocked off one line of the test letters. It is obvious that this aperture could be made of different sizes and shapes depending upon what is wanted in the projected image. For example, two or three lines of test letters could be blocked off if desired, the whole card or any part of it could be illuminated, etc. There is no reason, moreover, why the aperture could not be made adjustable in size to suit the needs and preference of the individual operator.

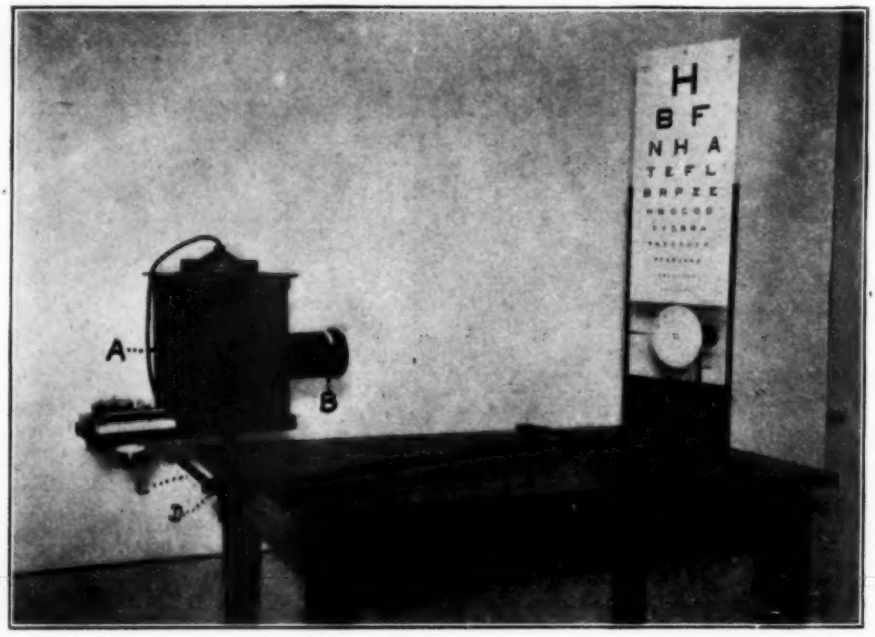

Fig. 1.—Acuity lantern and apparatus for testing the light sense and for determining acuity at low illuminations.

The changes in intensity of light were produced by means of an iris diaphragm. When such a diaphragm is placed either at the front or back surface of the focussing lens, changes in the flux of light can be produced without any alteration in the size or shape of the image produced by the lens, just as happens, for example, in the action of the iris of the eye.

A photograph of the apparatus is shown in Fig. 1. At A is represented the lantern or lamp house which is of course the important feature of the apparatus. It contains the source of light, the aperture, the diffusing surfaces, the focussing lens, and the iris diaphragm. The source of light is a well seasoned type C Mazda lamp, of the round bulb steropticon type of 100, 250, or 500 watts, depending on the range of illumination that is desired. This lamp is installed vertically in the roof of the lamp house at such a height that its filament is well above the aperture which is to be illuminated. In order to secure a uniform and diffuse illumination of the aperture the lamp box is lined with opal glass ground on one side.

The aperture, 6 x 1 cm., is cut at the center of the cap covering the inner end of the projection tube B. Further to aid in the even illumination of the aperture it is covered with a diffusing slide of ground glass. At the further end of the projection tube, 18.1 cm. from the aperture, in a brass ring and collar is mounted the focussing lens. This lens is 7.5 cm. in diameter and has a focal length of 15 cm.

It is scarcely needful to point out here that a different strength of lens could have been used and different relative distances of aperture and test card from the lens. With appropriate variations in these factors the distance of the lantern from the test card, and the amount of magnification of the projected image, may be varied. Any increase of magnification results of course in a decrease in the brightness of the image; hence an increase in the scale of brightness of image with no change in its size could have been obtained by increasing the size of the aperture and decreasing correspondingly the amount of magnification. In the construction of the present apparatus a 15 cm. focal length lens was used, because it could be obtained most readily on the market of the diameter needed.

Just back of the lens, mounted in the same ring, is the iris diaphragm. The pupillary diameter of this diaphragm ranges from 5 to 65 mm. At a suitable point on the circumference of the diaphragm is fastened a pointer which, as the diaphragm is opened and closed, moves over a translucent millimeter scale. This scale is mounted over a slot in the projection tube, and receives its illumination from the light inside of the tube. The inside of the tube is painted a mat black. To prevent the overheating of the lamp box, a rather elaborate ventilating system is provided, consisting of a light-tight ventilating hood at the top and a series of holes on two sides at the bottom of the box furnished with light-tight shields. On the platform supporting the lamp box are mounted a small Weston ammeter, and a small rheostat; to guard against fluctuations in the current and consequent fluctuations in light intensity.

In order that any line on the chart may be illuminated at will, the platform supporting the lamp box is mounted at the end of a rod which is raised and lowered by means of a rack and pinion. The pinion is operated by the small crank C, and the position of the box is fixed at any given height by means of the set screw D. The test card is mounted in a frame at a distance of 87.6 cm. from the focussing lens.

In order that the intensity of light used at any time may be known, a calibration chart is provided in which are given the readings on the millimeter scale and the equivalent meter-candle values at the test card. This calibration was accomplished as follows. The lamp box was removed and mounted on a photometer bar, at a distance from the photometer head equal to its original distance from the test card. The scale was then gone over point by point and the meter-candle value of the light at the photometer head was measured. The calibration chart is shown in Fig. 2b. In Fig. 2a is shown the calibration curve in which the divisions of the millimeter scale are plotted against meter-candles at the test card. These values are corrected to conform at the center of the card to the cosine law.

For our own use in the laboratory we have preferred to substitute for the Snellen chart a single test character. This can be turned in different directions, and the judgment of its direction rather than the recognition of the character, is required of the observer as a test of discrimination. Our reasons for this preference are as follows: (1) A test letter may be recognized when it is not seen at all clearly. Recognition is too dependent on extraocular functions to be used with precision as a measure of ocular capacity. (2) The different letters of the Snellen chart set an unequal task for the resolving power of the eye. (3) An objective check is had on the correctness of the judgment. This is especially helpful in case of children and the unintelligent, untrained and subjective type of adult. (4) By the use of the same test character, turned in different directions at will, all possibility of learning the test series is eliminated. Also the test object becomes much more valuable for the detection of astigmatism. (5) At low illumination the eye fatigues very rapidly. Thus if the task is the reading of the whole line of letters, the results obtained measure not only acuity but the power to sustain acuity; which may or may not be compatible with the purpose of the test.

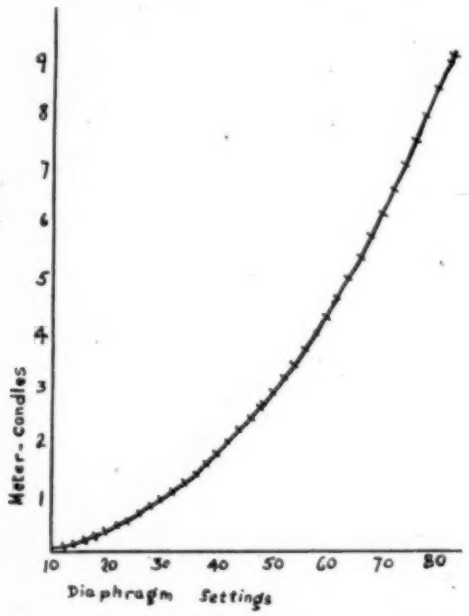

Fig. 2a—Chart showing relations of diaphragm settings (given at bottom) two meter candles of illumination secured by such settings (shown on the left).

The apparatus was designed to meet a specific testing need of the Navy. However it has, we believe, the following uses in clinic work: (1) When used with a higher watt lamp it provides an acuity test apparatus or lantern with which the test card can be illuminated by a constant and known intensity of light, abundantly high in the scale to meet the Snellen standard of acuity. (2) When used with the 100-watt lamp it serves for those cases in which there is need for testing scotopic or twilight vision, and the amount and rate of scotopic adaptation. It thus affords a very feasible and precise means of testing the light sense in so far as it affects the power to see clearly, the effect with which we are the most concerned for the greater part of our working lives. Also the 100-watt lamp is sufficient for the testing of photoptic acuity in the case of the greater number of eyes which would ordinarily be graded as normal. (3) If the image of the aperture is projected on a blank white surface of good reflecting power, more particularly if its size and shape are changed to that of a square or circle, of dimensions favorable for making a sensitive judgment, the apparatus can be used with an equal degree of precision and convenience for testing the light sense directly, in terms of the amount of light required to arouse just noticeable sensation. That is, the threshold of sensation can be determined in terms of meter-candles of light falling on the test surface. (4) By making it possible to determine with great exactness the minimum of illumination at which the test object can just be discriminated, the apparatus provides a very sensitive means for detecting small errors in refraction and in their correction, as will be demonstrated later in the paper.

Sensitivity for detecting small errors in refraction and their correction could also be added to the acuity test, by using test objects of slightly vari-

able size. However, no means has as yet been provided for making small changes in the size of any acuity object, sufficiently complicated in form to test simultaneously the resolving power of the eye in any great number of meridians which is, we believe, a very important feature in determining the exact location of an astigmatism, or the exact amount and placement of its correction.

We consider this an important feature in testing for astigmatism because of our belief that the astigmatic eye in the attempt to compensate for its defect has in many cases at least acquired unusual powers and habits of accommodation. Our belief in this is based on three sets of observations: (1) In the use of the astigmatic chart without a cycoplegic in cases of low astigmatism, one is frequently annoyed by the astigmatic indication shifting from one meridian to another. (2) We have found observers who could voluntarily, in some cases requiring considerable practice, shift the meridian showing the astigmatic indication. (3) In our test of astigmatism based on the relative speed of discrimination in the different meridians, presented to this Society last year, the speed of discrimination for the least favorable meridian can be increased by practice almost to equal that in the most favorable meridian with an equal amount of practice.

This result is so noticeable that in order to make the test sensitive we were compelled to eliminate as much as possible the opportunity for the effect of practice. This was done in two ways. The series was always begun below rather than above the minimum time of exposure required just to detect the direction in which the test object was turned; and meridians were inserted in the series clearly outside of the region of maximum astigmatic effect in order to break up any progressive tendency to accommodate, especially for the meridian showing the poorer resolving power.

The fact that the eye can with long exposures discriminate a fineness of detail in its unfavorable meridian which it is utterly unable to master with short exposures, and that this excess lag can be overcome in a considerable measure by practice, seems to indicate that it has the power thru its active accommodation to overcome in part the effect of meridianal inequalities in resolving power; at least when a test object taxing the resolving power in only one meridian is turned successively into different meridians. In any event it seems the part of sound procedure to guard against the possibility of selective meridianal accomodation, by the use of a test object which taxes the resolving power of the eye in as many meridians as possible.

But even if a test object, complicated in form and minutely adjustable in size, were available; a device for determining the minimum illumination at which a test object subtending the standard visual angle can be just discriminated, would afford a still more sensitive means for the detection of low astigmatisms and small errors in the amount and placement of their correction. This follows rather obviously from the fact that for all but very low intensities acuity changes slowly with change of illumination. That is, for all but very low intensities, small differences in acuity correspond, comparatively speaking, to large changes in illumination.

Used as we have recommended, the illumination scale thus becomes in effect an amplified indicating scale; by means of which the relatively slight differences in acuity, represented by the proper correction of an error in refraction and small deviations therefrom, may be detected with comparative ease and certainty. It is not infrequent perhaps to find that in cases of low astigmatism, with the full illumination of a test object presenting no smaller gradations in visual angle than are found in the Snellen chart, the observer is able to detect no difference in the ease or clearness of discrimination of the test character thru a range of 20 to 40 degrees in the placement of the correction.

This difficulty is especially annoying in the case of children and in the un-

intelligent, untrained and subjective type of adult. In such cases the apparatus shown here is especially helpful. With it a minimum is left to the comparative and observational powers of the subject. All that he is required to do is to indicate the direction in which the test object points, the most favorable amount and placement of the correction being determined by the minimum amount of illumination at which he is able correctly to give this indication. The apparatus possesses ample sensitivity, as our results will show, for the detection of an error of 5 degrees in the placement of the correction of a low astigmatism or of 0.12 diopter in the amount of the correction.

It will be noted, for example, in the tables given in our second paper, that an error of 5 degrees in the placement of the correction of an astigmatism, produced by 0.25 diopter cylinder, required as an average for five eyes 66.5 per cent more light for the discrimination of the test object, than did the correct placement. In case of an astigmatism produced by a 0.75 diopter cylinder, it required 107.5 per cent more light than the correct placement. The large number of scale divisions between the correct and the incorrect placements of the cylinder will be noted also in these results. In case of the 5 degree displacement of the correction of the 0.25 diopter astigmatism, this difference averaged 9.5 for the five eyes. That is, since the apparatus can be readily set to half divisions, 19 settings of the light control could have been made with precision between the values needed for the true correction and the 5 degree displacement. This shows that the sensitivity of the apparatus far exceeds the present possibilities of the precise manipulation of the correcting cylinders.

In case of an error of 0.12 diopter in the amount of the correction, 54.9 per cent more light was required for the least favorable than for the most favorable meridian; and in case of an error of 0.25 diopter, 106.7 per cent.

CALIBRATION CHART.

Diaphragm Setting	Meter-Candles	Diaphragm Setting	Meter-Candles
82.5	9.19	46.0	2.46
82.0	9.04	44.0	2.23
80.0	8.54	42.0	2.02
78.0	8.06	40.0	1.81
76.0	7.58	38.0	1.61
74.0	7.12	36.0	1.43
72.0	6.67	34.0	1.27
70.0	6.23	32.0	1.12
68.0	5.81	30.0	0.97
66.0	5.43	28.0	0.82
64.0	5.06	26.0	0.69
62.0	4.71	24.0	0.58
60.0	4.36	22.0	0.48
58.0	4.02	20.0	0.38
56.0	3.72	18.0	0.28
54.0	3.45	16.0	0.21
52.0	3.18	14.0	0.16
50.0	2.93	12.0	0.11
48.0	2.69	10.0	0.07

Fig. 2b—Calibration Curve.

INJECTION OF OILY SOLUTION OF IODIN FOR GLAUCOMA.

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MONTREAL, CANADA.

Five cases are here reported in which this new procedure was used with apparently very good results. The author had previously employed it successfully in iritis.

The similarity in the acute symptoms of septic iritis and glaucoma, if one excepts the purely mechanical effects in the latter disease; and the fact that pain in iritis is so promptly relieved by iodin, have led the writer to use this drug in some recent cases of glaucoma. The results have proved most interesting, and it seems probable that further experience will demonstrate that we have in iodin a very valuable adjunct to the measures at present employed in treating this disease. In the following cases the relief from pain and abatement of symptoms were very prompt and marked.

CASE 1. A woman of forty odd years. Left eye absolute glaucoma, right seriously impaired, was trephined some years ago with good result. Three years later she came with an acute attack, complaining of pain and loss of vision. The eye was hard, showing ciliary injection and cloudy media, apparently more from round cell infiltration than edema. She was given an injection of iodin, and all signs and symptoms disappeared promptly, only to return again in two weeks in greater severity. Another injection was given and the extraction of some roots from the jaw ordered. The symptoms disappeared as before, and did not recur at the time. Two years or so later another attack came on, while the writer was absent from the city, an iridectomy was done with unfortunate result and the sight lost.

CASE 2. Woman forty years. Had subacute glaucoma for a month with the classical signs and symptoms; after some preliminary treatment, she was given iodin, and shortly afterwards consulted another oculist who denied the diagnosis. As both my confrere and myself are capable of diagnosing glaucoma with the usual signs, it is evident that the symptoms had disappeared before the consultant saw the case.

CASE 3. Woman 35 years old. Had acute glaucoma in both eyes, the symptoms were severe and the inability to use the eye distressing. Vision 6/36 to 6/24. She was given iodin once a week for a month, and was then able to use her eyes quite comfortably, vision having returned to normal. Extensive gingivitis was treated and later two alveolar abscesses were evacuated, but the acute symptoms had disappeared before the teeth had been attended to. Recent reports nearly a year later, do not indicate any recurrence.

CASE 4. Man 60 years old. Right eye had iridectomy done, a week before the writer was asked to see the case, owing to the left eye having become affected. The patient was suffering severely, and was not relieved by the morphin which had been given. He was sent to hospital, for operation next morning, and was given iodin. He passed a comfortable night and in the morning the eye was practically painless. A trephine operation was done and there was no complaint of pain afterwards and but little reaction from the operation, vision in the left eye becoming normal in a few weeks time. Eserin was prescribed by the patient's physician during the last attack, and four days after the acute symptoms had subsided the condition was as follows:

Right eye sensitive, moderate congestion to nasal side, anterior chamber very shallow, pupil half dilated, immobile; apparently displaced upward owing to retraction being greater above than below. At eight o'clock were one or two pigment spots, one of which was within the pupil. The fundus was somewhat congested, no depression of discs, no gross change in the fields, tension not raised, vision 6/6 with + 6.5. J. 1. with + 10, better with + 11.

This case would seemingly correspond to Parker's type of glaucoma in-

volving the posterior lymphatics (A. J. O. v. 2, p. 628), but the presence of recent posterior synechiae and a dilated immobile pupil suggests both glaucoma and iritis. Examination three days after iodin had been given showed disappearance of subjective symptoms and of the congestion. The pupil was still immobile, but displacement was not quite so great. Three days after the second dose there was active contraction of the lower part of the pupil on stimulation by light, the upper part being still immobile, with an angle in the margin at eleven o'clock, due to dilatation limited to this one point. A week later the pupil was nearly in normal position, somewhat oval in shape, greatest dilatation at eleven o'clock (but no angular kink as previously). From about ten to two o'clock it was still immobile. The eyeball was still soft and there were no subjective symptoms present.

Eserin causes only moderate contraction of the pupil, the paralysed section remaining inactive. But since the margin as a whole has contracted the condition is evidently not due to hidden synechiae.

This interesting symptom-complex exhibits in an unusual manner that most constant symptom of all forms of glaucoma, interference with the motor function in the eye, and was associated at its onset with an abscess inside the right cheek; there are no teeth or roots in the jaws. When seen recently, some three months after the onset of the attack, the pupil was normal in appearance and action.

Case 5. Woman aged 60. Has had several attacks of severe pain in the right eye during the past few months; when examined nearly a year ago no pathologic condition was found, vision with plus 7 = R. 6/5 L. Amblyopic.

The writer's experience with iodin in iritis has convinced him that it is not unreasonable to attribute to the drug the unusual effects obtained in these cases, and while sweeping conclusions are not justified by such limited evidence there are one or two practical points suggested by these results which are worth considering in connection with glaucoma.

Iodin acts by stimulating leucocytic activity to a marked degree and thus tends to disperse inflammatory foci. So powerful indeed is its action in this respect that in the presence of gross lesions, such for instance as pulmonary cavity, acute toxemia is induced, which may end fatally.

Schnabel's observation that artificially induced arterial pulsation in the eyeball is accompanied by emptying of the veins and paling of the disc, while in glaucoma pulsation coexists with venous engorgement and a congested disc, is conclusive evidence of interference with the venous outflow from the eyeball.

The many pathologic reports published, showing alteration in the veins with blocking of both veins and lymphatics by round cells and debris furnish further evidence of this interference, which, by causing hypertension in the eyeball, compresses the outlet of the veins still more, thus establishing a vicious circle.

If now, we can by stimulating leucocytosis restore the circulation and remove the causes of stasis, and this appears to have occurred in the cases reported, we shall have practical proof of the importance of the vascular factor in causing glaucoma.

It would thus seem that the chemical and physical changes upon which Fischer lays stress are secondary to, rather than a cause of circulatory disturbance. These cases indicate also that the vascular change is due to sepsis, but further work is required to establish the rôle of the infective agent both in glaucoma and iritis, more especially in chronic glaucoma in which evidence of stasis is lacking.

In practise, the relief from pain following the use of iodin in inflammatory cases and the fact that its employment in conjunction with Elliot's operation minimizes postoperative reaction, and any tendency to closing of the trephine opening by exudate, strongly favors the adoption of this simple procedure, which in no way contraindicates ordinary methods.

If we can depend upon obtaining results such as those given above, we shall, in doubtful cases, cause arrest of the disease and disappearance of the symptoms, even while we are arguing about the diagnosis. While in severe cases iodin will enhance the result of operation and afford great relief to the patient.

Ten to fifteen minims of a one in forty solution of iodin in Sesame oil, was injected once a week under the skin with a hypodermic syringe. Judging from the strength and dose of several preparations on the market, the dose used in these cases can be increased considerably without harm resulting, possibly with benefit. Massive dosage in sepsis is recommended by the owners of our proprietary preparation. Failing Sesame oil which is at present difficult to obtain, almond or almost any bland fixed oil can be substituted.

When is glaucoma not glaucoma? The paraphrase is certainly suggested by these cases, which, altho differing in type are obviously all related. It is far more practical in a given case, to remove disease than to demonstrate that it belongs to established type, and should be labelled accordingly. The facts above recorded indicate the direction in which we may reasonably look for further progress in treating this often intractable disease, and the case of a well known statesman whose loss of sight is stated to be due to alveolar abscess adds point to this observation.

THE ORGANIZATION AND ACTIVITIES OF THE OPHTHALMIC SERVICE IN THE AMERICAN ARMY OF OCCUPATION

RALPH A. FENTON, M.D.,

PORTLAND, OREGON.

This is a supplement to the paper of Col. Greenwood published last year, A. J. O., v. 2, p. 565., Major Fenton having been ophthalmic consultant for the Army of Occupation. The two papers constitute an authoritative history of the ophthalmic service in the American Expeditionary Forces. Authority to publish granted, Board of Publication, S. G. O.

Suggestions from Colonel Black to Colonel Greenwood regarding eye service in the Army of Occupation, as published in Col. Greenwood's report (A.J.O. v. 2, p. 583), were necessarily modified by direction of the Chief Surgeon, Colonel J. W. Grissinger, M. C., to meet conditions found on arrival in Germany. The assignment of a combined ophthalmologist and otolaryngologist to each division, with use of a field hospital in each division for mild eye cases, was never done because of lack of personnel and equipment, as well as accessibility of evacuation hospitals to divisional areas. The other suggestions, of centers for eye work in Treves and Coblenz, with auxiliary optical units for supply of glasses, were fully carried out; and the Chief Surgeon was ready at all times to facilitate in every way the elaboration of clinical equipment and the provision of highly qualified personnel. Colonel Black's valuable counsel was available from Luxemburg on into Coblenz, during December, 1918, and again for a few days at the end of January, 1919.

During the American advance from Ligny-en-Barrois, November, 1918, thru the devastated region above Verdun and across Luxemburg, there was little special work, except for occasional cases of injury to children and other civilians from abandoned German grenades or other munitions. Several cases of this type were seen in a field hospital at Longwy, and were turned over to French authorities as the troops moved forward. Other civil cases, left by the Germans practically without medical supplies, were in charge of French sisters in a convent hospital at Longuyon, the first field headquarters. Supplies were furnished them and an army hospital worked with them for a time. While headquarters were here and at Luxemburg,

until December 1, cases were evacuated to Evacuation Hospital 15 near Verdun; and to E.H. 18, which had come up to a good location at Briey. But these were long and difficult ambulance rides over ruined roads, so that most cases were held in divisional field hospitals pending arrival of the first evacuation hospital in Treves, December 2nd, by rail.

Only one track was open from Metz to Nancy, via Pont-à-Mousson, during November and December; the old main line, Paris-Strasbourg via Metz and Verdun, was destroyed by many battles; so that over that one grapevine track, hastily lain over shell holes and thru ruins, came rations and supplies and hospital trains for the American army of three hundred thousand, and for much of the huge French force beyond Metz toward the Rhine. Trains were stalled for days waiting to pass, but the hospitals came thru among the first.

German permanent barracks and public buildings were commandeered for hospital use; and in the barracks an immediate problem was to clean up the filth of every sort left by the retreating enemy. Improvisation of proper ophthalmologic quarters was often slow and difficult.

The writer was privileged to accompany Colonel H. C. Maddux, M.C., in charge of hospitalization, on a special mission in advance of the American troops, to Coblenz and across the Rhine to Ems, on December 4, 5 and 6, 1918. During this trip, numerous barracks, schools, hotels and other public buildings were inspected; and in Coblenz and at Ems, as the German forces were still present, officers of the Sanitäts-Amt Hauptquartier VIII. Armeekorps, assisted the inspection. It was noticed that all German troops in this rearguard were well equipped, altho remarkably lacking in respect for their own officers.

Base hospitals were not sent into Germany; the readily mobile evacuation hospitals, fully staffed and fresh from their achievements on various fronts, were selected and sent up to function as bases. These veteran outfits were soon to be relieved by other excellent junior organizations, for the journey home. An ophthalmologic and oto-laryngologic service was arranged for each hospital; names and locations are listed herewith:

E. H. No.	Opened	Location	Type of Buildings	Ophthalmic Cases Handled from	Replaced by E. H.
2	Dec., '18	Coblenz	Barracks	Own command (medical, venereal, infectious)	49 February, 1919 Closed June
3	Dec.	Treves	Barracks	Eye Center (surgical; 89th and 90th Divisions)	19 February Closed May
4	Dec.	Coblenz	School	Eye Center (1st, 2nd, 3rd, 4th, 32nd and 42nd Divisions)	22 February Closed May
6	Dec.	Coblenz	Military hospital	Own command (surgical, orthopedic officers)	27 Feb. to June Now Base H. for U. S. A. in Germany
7	Jan.	Prüm	Courthouse	Own command (general; 89th and 90th Divisions)	29 February Closed May
8	Dec.	Mayen	Hospital and Schools	Own command (general; 3rd and 4th Divisions)	30 February Closed May
9	Dec.	Coblenz	Barracks	Own command (medical)	.. Closed May
12	Dec.	Treves	Barracks	Own command (medical, venereal, infectious)	.. Closed May
13	April	Walferdange (Luxemburg)	Chateau	Own command (general; 5th Division)	.. Closed May
14	Dec.	Coblenz	Hospital	Own command (neuropsy-chiatric; Eye Center, May and June)	16 March Closed June
26	Feb.	Neuenahr	Hotel (Apollinaris Spring)	Own command (general; 42nd and 4th Divisions)	.. Closed May

Each organization, tho supposed to bring complete equipment, needed extensive provision of supplies, due to loss and depletion during active service; and in some instances organizations had never received full outfits for eye work.

The eye and ear-nose-throat center

at Treves, E.H. No. 3, was established in the Horn-Kaserne, across the Moselle from the city.

The Coblenz center, for six of the eight divisions, was E.H. No. 4, located in the Lehrerinnenseminar on the island of Oberwerth, in the Rhine about a mile south of the center of Coblenz. German civil authorities tried to have this building exempted under armistice provisions as a school, and the young women normal students and teachers, hastily assembled, were all at work when the hospital arrived late in December. But as Col. Maddux and the writer had found German military hospital beds in place on preliminary inspection December 5th, "school" was hastily dismissed, and the Herr Direktor was restricted to four rooms of his mansion, which became the nurses' quarters. The picture herewith was taken during German occupation as an auxiliary military hospital. Similar obstructive tactics were encountered in other locations, notably Mayence.

Special commendation is due Capt. H. H. Ainsworth, Maj. Clarence King, Capt. E. J. Stein, Lieut. C. C. Cowin, and Capt. N. G. Shafritz, for organizing and carrying on the immense Coblenz clinic, and to Capt. Clifford A. Peacock and Maj. N. P. Wood for a similar task in Treves.

Two auxiliary optical units, with a considerable supply of such lenses and frames as were still available in Paris, arrived late in December and were assigned to the centers in Coblenz and Treves. Very complete equipment for all types of eye work was assembled in these centers.

Evacuation Hospital, No. 4-22, Coblenz. Eye Center, Coblenz District

Orders were issued by the Commanding General directing observance by Third Army ophthalmic surgeons of circulars and reports governing the A.E.F. before the armistice. Eye cases were ordered to the nearest evacuation hospital without delay, and location of hospitals was such that most cases could be handled as out patients. The saving in expense and hospital time, as well as in time from duty, was enormous.

The educational program arranged for the army, the large amount of accumulated clerical work in organizations, and the fact that men in the combat divisions had been moving about too rapidly for many months to secure refraction or replacement of glasses, brought out a very large number of

cases for refraction as soon as the Army reached its objectives in December.

To prevent congestion, the Commanding General ordered such cases to be handled by appointment, as out patients, in groups of not more than five or six men from a given command; such men were required to report by 8 a. m. of the appointed day; examination was made under homatropin, glasses were made and supplied, and the men were returned to their commands the same day, or at any rate within 24 hours. Glasses not available in the stocks on hand were obtained from Paris, and as a Third Army mail car came thru daily, service was far better than before the armistice.

The Paris plant, almost worn out by demands from all over France, and deprived of needed replacement material long overdue from the United States, could not fill all orders. Authority was therefore obtained from the Chief Surgeon and the 4th Section of the General Staff to requisition (and later to take over by purchase) all suitable lenses, frames or cases found in optical establishments in the American occupied area; and to ascertain facilities for delivery of more lenses from other occupied areas or even from the interior of Germany.

It was found that strikes and Spartacist disturbances had closed the huge Rathenow factories near Berlin, as well as the Rodenstock establishment in Munich; the latter was deprived of raw glass because its furnaces were in French Alsace. One small grinding plant inspected in the French area near Mayence had only unfinished stock, but reported a considerable lot of old American "export" stock on hand at its wholesale warehouse in Frankfort. American lenses being flat, 40 mm, the great stocks of German army lenses, all toric, 38.2 mm, were useless. Comparatively few plus lenses could be found, especially in needed weak cylinders and combinations; the stocks were overwhelmingly minus and spherical.

Colonel Black and Major Edmonds (chief of the Optical section, from Paris) arrived opportunely for a few days at the end of January, and a list of six months' probable requirements of lenses for the Third Army was prepared for the Chief Surgeon, by Maj. Edmonds, as follows:

Minus and Plus Spheres (0.25 to 8.00)	106 doz. pairs
Minus and Plus Cylinders (0.25 to 5.00)	102 doz. pairs
Compounds, Plus-plus and Minus-minus (Sph. 0.25 to 4.00, combined with cyl. 0.25 to 1.50)	528 doz. pairs
Total	736 doz. pairs

The entire available stock of American lenses in Frankfurt was secured by a flying trip over the lines ahead of Mayence, and returned consigned to an optical firm in Coblenz, from which it was immediately requisitioned. These lenses were taken to Paris by Maj. Edmonds to be cut to the standard American size. Another enterprising Coblenz optician later secured considerable supplies of lenses from Rathenow, near Berlin, in quantities based on Maj. Edmonds' estimate, and these were either requisitioned or purchased. Many officers and men, rather than wait for lenses to be made up in Paris, took their prescriptions to German shops, where Punktal and other precision lenses could be had from Zeiss, in a few days for twenty or thirty marks the pair.

Homatropin, pilocarpin, and other alkaloids, with dionin and fluorescein, were hard to get in the A. E. F. during 1918. A vast supply of drugs was captured in the pharmaceutic warehouse of the VIII. Armeekorps at Coblenz, and large bottles with many ounces of homatropin and pilocarpin—probably more than existed in all the rest of the A. E. F.—were turned over to the Coblenz eye center at E.H. No. 22.

An advance Medical Supply Depot was opened in connection with Advance G. H. Q. at Treves, making available many instruments, including electric ophthalmoscopes. Batteries for these were obtained from the Signal Corps or German sources. Material assistance was always afforded by

Colonel George M. Edwards, M.C., medical supply officer on the Chief Surgeon's staff, in obtaining necessary ophthalmologic equipment and drugs, and in facilitating the requisition of lenses and other necessary German supplies.

The total number of eye cases treated in Third Army hospitals up to May 1, 1919, was 10,746, for a little over five months. These were divided as follows:

Cases of refraction	5615
Prescriptions for glasses	4952
Pairs of glasses made and furnished	2279
Prescriptions mailed to Paris for supply	1575

Probably about one thousand more eye cases were handled during May and June, before the Army went home. The largest month was March, with 2,372 eye cases under treatment. Of these but 250 occupied hospital beds, and 449 were in hospital for other causes. The wisdom of avoiding hospitalization of such cases, retaining them on a duty status, is thus justified.

The following is the list of opthalmologists who served with the Army of Occupation, with their commands and the months of their service:

Maj. Ralph A. Fenton, Senior Consultant, Hqrs.

Capt. H. H. Ainsworth, E. H. 14, 4†, 22†, Dec.- Apr.

Lieut. G. C. Allen, 29, 13, Mar.-May.

Maj. John W. Burke, 22†, March.

Lieut. C. C. Cowin, 16, 22, March-May.

Capt. C. E. Edison, 4, January.

Capt. E. C. Foote, 8*, Dec.-Feb.

Capt. Patrick Gordon, 22, 16, May-June.

Capt. T. C. Gittins, 12, Dec.-May.

Lieut. Jas. Gostanian, 12, Dec.-May.

Capt. E. J. Hussey, 13, Apr.-May.

Capt. E. W. Hanson, 22, April.

Capt. Henry E. Keely, 6*, 27*, Dec.-June.

Capt. Rufus Jackson, 9, March-May.

Maj. Clarence King, 4†, January.

Capt. A. R. McKinney, 30, Feb.-May.

Capt. Clifford A. Peacock, 3†, Dec.-Feb.

Capt. R. C. Person, 14*, 16*, Feb.-June.

Capt. Ernest Rau, 2, 49, Dec.-June.

Lieut. Robt. E. Reimers, 7*, Dec.-Feb.

Capt. N. G. Shafritz, 22†, 16, Feb-June.

Capt. E. J. Stein, 9, 22, 16†, Jan.-June.

Lieut. Justus Sutherland, 19, Feb.-May.

Capt. H. M. Weed, 26, Feb.-May.

Maj. N. P. Wood, 27, 19†, Feb.-May.

Capt. J. J. Zimmerman, 13, April.

(* also doing ear-nose-throat work; † chief of clinic.)

Interference with service due to changing personnel was met by frequent visits, by arrangement of leaves to the Coblenz and Treves centers for clinical work, and by weekly gatherings at dinner in Coblenz. Too much cannot be said in praise of those who kept on with the tiresome grind of refraction, without the incentive of active operations, month after month while others were succeeding in getting ordered home; and it is proper to say that the Chief Surgeon approved a number of promotions which were held up at the last moment, "higher up."

The constant cooperation of Major John B. Rae, M. C., Senior Consultant in Oto-Laryngology, was most delightful; his long experience with Colonel McKernon as a Consultant during 1918 made him an authority on organization and personnel.

Special study of obscure eye disabilities prior to evacuation homeward was made in the eye centers. Several malingerers were caught and returned to duty, while others who had camouflaged their visual defects in order to get into the front lines or regain their commands after injury were sent to the United States. One case of true sympathetic irritation was detected in an officer who had rejoined his outfit after treatment of an eye blinded by battle injury and refusal to permit enucleation at that time. Office work with his command in the Army of Occupation brought on the sympathetic attack which yielded to prompt enucleation of the blind eye. Many cases

of severe choroiditis, and a few of macular hole, were sent back for reclassification. A few cases of trachoma were detected; this disease was made specially notifiable by Army order, and through the Army epidemiologist prompt separation of affected individuals and observation of others exposed in commands were effected.

During March and April, a number of cases of eye injury from rifle backfire came in from certain divisions; some were serious and necessitated enucleation. Defective or ill fitting amunition, especially clips of German cartridges used by mistake, were said to be to blame. One case, in which a fragment was embedded external to the optic foramen at the base of the orbit, came from explosion of a rifle grenade at the end of the gun barrel. For all such cases elaborate magnet and localization equipment was ready. Fourteen enucleations were done; in most cases implantation of glass spheres was made with success. Two glaucoma cases required trephine operation, one in a medical officer. A few pterygia were operated, in cases where men intended remaining in the service.

The Third Army Medical Society, which held clinics twice monthly in successive Coblenz hospitals, was given a very extensive eye and ear-nose-throat program at the Coblenz center in March; medical officers came in from all over the Army for these meetings.

A detailed study of the German method of supply of glasses to troops was made from official documents and from examination of captured material; this will be reported elsewhere.

A course in facial reconstruction surgery, arranged largely by Major L. M. Francis, M. C., of Base Hosp. 115, Vichy, and Médecin-Major Fernand Lemaitre, chief surgeon of the splendid French facial hospital there, was authorized by the Chief Surgeon for several three-week courses in Paris hospitals during the spring of 1919. A number of ophthalmologists from the Army of Occupation, in order of service, were assigned to this work, which was cut short by Major Lemaitre's departure for America at the end of May.

Very remarkable clinics and lectures based on French war wounded were arranged in various military and public hospitals by Professors Morax, Sébileau and de Lapersonne, Major Lemaitre, and Drs. Poulard and Magitot. The splendid photography and lectures in English by the latter three made especial appeal. It was felt that all possible effort should be made to extend the sphere of French postgraduate teaching among American specialists, of whom a number were found working in French clinics under the provisions of the A. E. F. order permitting leaves for collegiate work. A syllabus of work observed in Paris was distributed to those Third Army ophthalmologists who had applied for this course and could not be accommodated.

Departure of the 42nd, 32nd, 89th and 90th Divisions caused shrinkage of all work, and in May hospitals were rapidly closed out and sent homeward. The eye center at Coblenz was moved temporarily late in May to E. H. No. 16 annex, in Ehrenbreitstein barracks across the Rhine, and the Treves center was closed. With the release of all evacuation hospitals in June and July, the occupying force dwindled to a few thousand, all needed special equipment was transferred to augment that on hand in the fine new Garnisonslazarett, (formerly chief hospital of the German Eighth Army Corps) used until June by E. H. No. 27, and now base hospital in Coblenz for all American troops on the Rhine.

INTERRELATION BETWEEN EYE, EAR, NOSE AND THROAT WITH PRESENTATION OF CASES

JOSEPH C. BECK, M. D., AND EMIL DEUTSCH, M. D.

CHICAGO, ILLINOIS.

Borderline cases require consideration and discussion by representatives of each specialty concerned. This series was presented and discussed at the Chicago Ophthalmological Society November 17th, 1919. see p.

Two years ago, before this society, I presented a number of cases that demonstrated the practicability of a man who practices opthalmology of having a very good knowledge of oto-laryngology, and vice versa. We know that the greatest number of specialists in this country practice these four branches at the same time—at least, in the smaller cities. It is with that view in mind that I present these cases. Personally, I see eye cases, as well as ear, nose and throat cases, altho I do not pretend to be as good an ophthalmologist as any of you men here. However, I recognize the importance of pathologic changes about the nose, throat and ear being in close relation with conditions about the eye; and therefore the importance of having an ophthalmologist associated with me who is able to assist me in the final diagnostic points. The cases I wish to present to you this evening are the following:

NEUROPARALYTIC KERATITIS

CASE I. The first case I wish to present is that of a nurse in the Cook County Hospital who was referred to me by Dr. Hassin on account of pain that she had behind her eye, and behind her mastoid, which pain radiated down into the neck, arm and to the fingers. This is recognized as the Sluder syndrome, of spheno-palatine ganglion irritation. This patient had severe pain in the mastoid region; so severe that Dr. Chapman, the attending oto-laryngologist of the Cook County Hospital, incised the drum, thinking she had acute otitis media. She did not improve following this incision, and another incision was made with no improvement whatever.

Then Dr. Holinger, Dr. Sonnenschein and Dr. Garraghan were called as consultants; and these gentlemen agreed that the mastoid ought to be opened because the pains were severe. A simple mastoid operation was done, without any distinct evidence of mastoiditis being present; and the patient improved for three or four weeks, but never was entirely well. The pains returned with greater severity, so that it was necessary to resort to opiates; and being at the nurses home for some time she was treated by the attending man as well as Dr. Hassin, who received the case at this point on account of the neuralgic pain. She gave a history of having had a sinus operation; and during the epidemic of influenza she was on day and night duty, and had to continue her work with a great deal of pain.

When she presented herself to me she had aphonia, and on examination I found the larynx injected, but no paralysis. It was the kind of aphonia which we characterize as hysteric aphonia. She had previously had a middle turbinectomy, but no evidences of pus. Proper treatment, following the method of Sluder for the diagnosis of spheno-palatine ganglion irritation was carried out, by the application of a concentrated solution of cocain to the spheno-palatine ganglion region without any benefit.

The injection of one per cent. carbolic acid in alcohol into the spheno-palatine ganglion was attempted, but failed. There was such hard bone in that region the needle would not penetrate and so a cutting operation was done. This was performed three days later by the aid of a bur until the spheno-maxillary fossa was opened. The spheno-palatine ganglion was injected and a characteristic reaction followed. The patient was not relieved.

A second injection was made a few weeks later, with no relief.

The patient complained of severe pain in the region of the spheno-palatine ganglion, but in addition a continuous pain along the branches of the fifth nerve, a deeper pain, which is recognized by neurologists as a Gasserian ganglion pain. These were not real recurrent attacks of Gasserian ganglion irritation, but a deep pain radiating all over the face and side of the head. These pains were severe, so that the patient required large doses of opiates continuously.

I was forced at this point to do something more radical, and decided to inject the Gasserian ganglion, a procedure which I have carried out a number of times without any untoward effects. It is well known that following removal, as well as the injection of the Gasserian ganglion, a neuroparalytic keratitis results. I attempted the injection in the usual manner of inserting the needle in the region of the cheek, externally and just below the malar bone, and passing to the base of the skull. Finding the socalled plateau external to the pterygoid plate and locating the foramen ovale, the Sluder needle is passed in until it strikes the anterior surface of the petrous portion of the temporal bone, in that fossa where the Gasserian ganglion lies. I injected this ganglion with the result of a partial numbness in the side of the face. This numbness was a relief from pain but of short duration. After a few days the patient complained as much as ever, and I concluded perhaps I had not gotten properly into the Gasserian ganglion and decided to repeat this procedure.

The patient was reluctant to have this done unless it could be accomplished under anesthesia. I put her under a general anesthetic and took her to the X-ray room, where I performed the injection. To be certain that I was in the ganglion, I had a stereoscopic X-ray picture taken while the needle was in position. As a result of this injection she seemed to get relief. She came out of the anesthetic, with numbness of one-half the side of the face, which is absolutely characteristic of the distribution of the fifth nerve. She was relieved of the pain.

Fig. 1. Case I. Neuroparalytic keratitis of right eye after injection of the Gasserian ganglion

Within a few days she began to show evidences of redness in the eye. The cornea was anesthetic, as it should be after such an injection, and there was noticed a condition about the eye which I will have Dr. Deutsch, who observed the eye after that, describe. The most important fact is to protect the eye against exposure.

Following the injection of the spheno-palatine ganglion she had diplopia, with paralysis of the abducens, a condition that Dr. Sluder reports in one case. The late Dr. Holmes, of Boston, has also had this condition occur.

NASO-ORBITAL MELANOSARCOMA

CASE II. I wish to show an unmarried woman, 52 years of age, who was referred to me with a tumor in the region of the eye, the lower lid, and at the junction of the nose at the internal canthus, about the size of a walnut. (Fig. 2). The growth has been rapidly developing and at the same time obstructing the nose. It was firmly attached to the orbit, and the question of diagnosis and its probable malignancy came up. The eye itself showed no marked evidences of disease. Further detail will be described by Dr. Deutsch. The nose showed complete blocking, and to make the diagnosis I decided to remove the growth and make a microscopic examination. The microscopic section shows it to be a melanosarcoma. (Figs. 4 and 5). Figure 3 shows the patient immediately after the operation.

We placed in the cavity created by the excision of the tumor, 75 milligrams of pure radium, and left it in for eight hours. As a result of this treatment the cavity was entirely healed, with a whitish membrane that usually results from the use of radium. The nasal condition was also attacked by radium, placing 25 milligrams by means of a needle into the mass that was blocking the nose. All the above treatment was done two months ago. She returned today for further observation and treatment. I find she can breathe thru that side of the nose fairly well, whereas formerly it was entirely blocked. Inspection shows there is a shrinkage of the growth within the nose, and an ectropion developed at the site of excised growth. I placed 25 milligrams of radium (pure) into the mass within the nose for 6 hours.

Fig. 2. Case II. Melanosarcoma of left orbital region

Fig. 3. Case II. Appearance after removal of tumor

All authors agree that melanosarcoma is one of the most malignant types of neoplasms, very rapidly disseminating and metastasizing, especially in the liver; and according to Crile's latest statement, it is always fatal, irrespective of treatment. It will be interesting to note the result in this case, and I hope I may be able to report a successful outcome.

RETROBULBAR NEURITIS

CASE III. The early history of this young man is that in a football game he had his nose smashed, with a hema-

toma of the septum that became infected, and he had a collapse of his nose as a consequence. This was ten years ago. I corrected the collapse of the nose by the injection of paraffin. Paraffin is not used any more for this purpose. It was cold paraffin I used in this case. Recently on his return from Army service in France, he noted the loss of vision in one eye. The diagnosis was made of retrobulbar neuritis due to nonsuppurative sinus disease, or hyperlastic sinuitis. An operation was performed (middle turbinectomy and ethmoid exenteration with exploration of the antrum, frontal and sphenoidal sinus) with excellent results. Dr. Deutsch will go more into detail in this case.

Fig. 4. Section of melanosarcomatous growth Case II, under low power

Fig. 5. Section of melanosarcomatous growth Case II high power.

Blunder in Diagnosis of Syphilis

Case IV. This little girl, aged 14, came into our service while I was away, and a diagnosis was made by Dr. Pollock of an otitis media catarrhalis, which was markedly progressive and she was getting quite deaf. There was not anything the matter with the nose or throat, but simply deafness. This changed the diagnosis to a possible otosclerosis. The patient was treated along the line we usually treat otosclerotic cases, using adrenalin injections, however in her case without any benefit. After several months of this treatment the patient developed a typical case of interstitial keratitis. A spinal puncture was made and a four plus Wasserman found. This case shows that an ocular condition can clear up the diagnosis of an ear condition. The patient was put on antisyphilitic treatment, and the trouble cleared up both in the eyes as well as the ear. She has normal hearing now. Dr. Deutsch will speak more at length about her ocular condition.

Tumor of the Cerebello-Pontine Angle

Case V. The last case I wish to report is that of a woman, about 32 years of age, who was referred to me by Dr. Gradle with a diagnosis of probable nonsuppurative or hyperplastic sinuitis. The patient had marked reduction of vision and a large blind spot. I examined her nose and found nothing indicative of any active sinus disease, but she had nasal obstruction in the upper straits of the nose. I performed an operation on this patient, cleaning out the ethmoid cells and opening the sinuses. The vision of the patient improved for about a week or ten days. Remember that this patient had no

headache to speak of. She gave no symptoms of any kind except that she did not hear well in one ear: I did not examine carefully the ear she complained of. I was intent on doing a sinus operation to clear up a possible retrobulbar neuritis.

The patient returned to Dr. Gradle after this operative treatment, but she left the city for a rest. When she returned a few weeks later Dr. Gradle sent her over to me. I found, as he stated, that she had a clear case of brain tumor with a choked disk of 10 diopters. A neurologist was called in consultation. We also made careful tests in this case as far as the labyrinth was concerned, and a diagnosis was made of the cerebello-pontine tumor and an operation was advised. The patient was operated on immediately. There is one interesting point I want to mention in this case. The patient had never complained that she could not lie on her face.

Fig. 6. Case V. Loose growth in cerebellar pontine angle. T shows the tumor in position

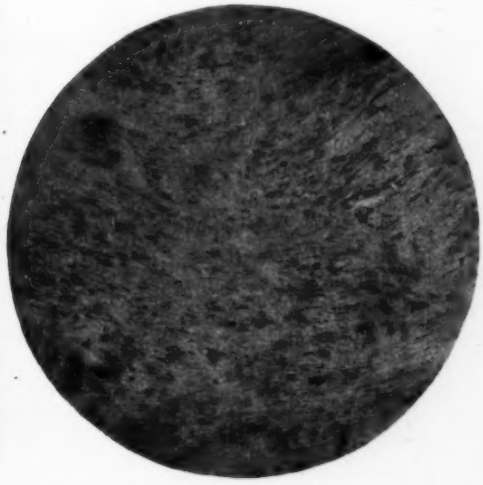

Fig. 7. Case V. Section of tumor under high power, showing structure of gliosarcoma

Operation. We placed the patient with face down as we would to operate for exposing the cerebellar region. Within a few moments after anesthetizing her she began to breathe shallow. We turned her over on the back and she recovered her normal breathing. Repeating the same thing, that is, turning her over on the face, she breathed better than in the first instance, so that we could go on with the operation. There was considerable difficulty in stopping the bleeding from the flap so that some time was taken up in the exposure of the cerebellar region. We did not get a chance to expose the cerebellum completely. Barely had we taken off the bony defect over the cerebellum when the patient stopped breathing. We turned her over on her back again, but all attempts at resuscitation were unsuccessful. She died on the table.

Postmortem (immediately after death). On removing the brain we found in the pontine-cerebellar angle region a loose growth. The cavity that it lies in has a definite fibrous capsule. (Fig. 6.) Had we been successful and exposed the area as we had outlined it, we could have removed the growth, because on one side we would have opened the dura, and when the growth presented it would have been removed. But we did not have a chance to do so.

Conclusions. We found a cerebello-pontine angle tumor which was very unusual, in that it was so freely movable. In reviewing the literature of the cases of Koenig and Cushing and others who have reported a number of

cases, I find that no report is made of a postmortem or operation in which there was such loose attachment of the tumor as in our case. It was located in the region of the vital centers; and no doubt, in the position we placed this patient for operation, the tumor was dislodged and pressed on the respiratory centers. This is the only explanation I am able to get from physiologists, and men who have had more experience in this line of work than myself.

Histologic examination of the tumor shows it to be a glio-sarcoma. (See Fig. 7.) I traced this growth into the internal auditory meatus, but found the bone normal. It is a tumor of the acousticus, with a most unusual condition of mobility, and in operating again on this sort of case I would inquire a little more closely into the history, or would test the patient in having him assume the position for operation while in a conscious state. I turned this case in a rotating chair in the different positions and found she had a dead labyrinth on the left side. I found in the X-ray picture that the characteristic enlargement that is seen in the internal auditory meatus was absent in this case.

Ophthalmic Aspects—Dr. Deutsch

Neuroparalytic Keratitis

There are two other forms of keratitis with which this is confused. These are keratomalacia and lagophthalmus. A grouping of these three forms of keratitis seems to be favored by the fact that all seem to present various features in common, such as dryness of the cornea with desquamation, lack of irritative symptoms present, in spite of severe findings in the cornea, and lack of photophobia, lacrimation or even pain.

In lagophthalmus there is characteristic desiccation of the epithelial layers of the cornea, which occurs in cases of paralysis of the facial nerve, because the eyelids cannot close the eye entirely. The palpebral fissure is enlarged; therefore, the cornea is exposed to air and there is desquamation of the epithelial layers, such as usually occurs in the lower segment. During the day a patient with paralysis of the seventh nerve is able by reflex action to wink with the eye and the cornea is being moistened. During sleep the eye rolls about. The lower one-third of the cornea is involved, due to exposure to air. This is characteristic of this condition.

The next comes in comparison with keratomalacia. I want to cite a case I saw not long ago in a hospital in Chicago. An intern told me about a case they had in the ward suffering from paralysis of the facial nerve, due to some extensive operation in the mastoid region, and as a result his eye was always open and the cornea hazy. I did not hesitate, upon examination of the eye, to say that it was a case of neroparalytic keratitis. But I now realize it was one of lagophthalmus.

A boy presented himself with a deep corneal ulcer. It was so severe that the whole cornea looked a milky mush and soft. The clinician made a diagnosis of keratomalacia. It may be true in the sense of the word that keratomalacia means a softening of the cornea. That is the case in the deep forms of ulceration. But in the literature on the subject we find keratomalacia is a different condition.

Keratomalacia occurs mostly in children that are debilitated and are suffering from a severe general condition. It is characterized first by night blindness, and occurs in younger children who are not able to walk about. So we recognize this condition by the dryness of the cornea and inflammation, and by fatlike globules which stick to the cornea. The lacrimal fluid mixed with the oily substance formed does not lubricate the cornea, and consequently dryness is the result.

The case presented here tonight is one of neuroparalytic keratitis, which is always due to a removal of the Gasserian ganglion or to paralysis of the trigeminal nerve. The point in this case was that three days after the Gasserian ganglion was injected, the woman developed some discomfort in the eye. In this condition, there were marked changes in the cornea. She

complained of discomfort, and redness in the eye. There was desquamation of the superficial layer of the epithelium, and it was in the form of fissures, shrunken. We also found five or six eyelashes in her eye, of which she was not conscious, proving that sensation to pain was not present. She had an insensitive cornea. The desquamation increased for two or three days, so that in the center of the cornea there was a depression like an ulcer. The characteristic feature is that it did not spread towards the periphery, altho the center of the cornea was deeply involved. It left the margins of the cornea ribbon-shaped, with transparency about two millimeters wide, while the rest of the cornea was deeply infiltrated. This patient was put on mild treatment of sodium chlorid, and boric acid, 1 per cent. red oxid ointment and bandage, and we had no further complications, such are often reported in these cases.

Neuroparalytic keratitis is due to trophic changes. The cornea having its nerve supply from the ciliary nerves, branches of the ophthalmic which is cut off, there is no sensation to pain. Interesting experiments on animals have been made in cases of neuroparalytic keratitis and, after removal of the Gasserian ganglion, within a short time the keratitis developed. After removal of the ganglion or branch of the fifth nerve on exposing the eye to air and preventing moistening of the cornea, a depression of the corneal epithelium is noticed. On account of the lack of nerve and blood supply diminished moistening is more injurious to such eyes than to healthy ones.

The cornea on account of lack of resistance, is liable to degenerative changes. Fuchs compares it to a form of hemiplegia, a bedsore rapidly develops on the paralyzed side, and is absent on the other side which is exposed to the same amount of pressure.

This patient's vision in the right eye, before the injection of the Gasserian ganglion, was 20/70. It is that now, but three days after symptoms were manifested it was simply perception of fingers from a distance of four or five feet, and persisted so for three weeks. The cornea is clearing up and there is hardly any danger of perforation any more.

Retrobulbar Neuritis

In this young man who came to us three months ago with a complaint of having lost his vision in the right eye entirely within a few days, ophthalmoscopic examination showed a typical picture of retrobulbar neuritis. There was a pericentral constriction of the field of vision, both for form and color. The case was referred to Dr. Beck, who already described the nose operation. Within two weeks, after reaction from the nasal operation had subsided, his vision improved gradually, until at present it is 20/40 with a practically normal color field, but constriction for white.

In the patient with the melanosarcoma near the region of the eye, there were no findings of the eye itself, referable to the growth. Her vision was 20/25, without any lesion in the fundus. Movements were also normal.

NOTES, CASES AND INSTRUMENTS

SOME RECENT OBSERVATIONS IN ASTHENOPIC EYES

S. D. Risley, M.D.,

PHILADELPHIA, PA.

In recent years I have had the opportunity to study a form of disease in asthenopic eyes which I had not before observed, but which because of its very frequent occurrence I now believe I must have overlooked. The first example to claim my notice was a case of constant pain in the head, culminating in violent exacerbations of sick headache which drove the patient to bed. To relieve these, his physician, Dr. Carol, who referred him to me for study of the eyes, had found it necessary to administer injections of morphia.

The man, aged thirty-five, was a grocer; large, stocky, fat man, weighing approximately 190 pounds, but barring his headaches, in good health. His acuity of vision was but slightly reduced, but he had a high grade of hyperopia with low astigmatism. The ophthalmoscope revealed granular changes at the fovea, and a fluffy eye ground, all details being faintly veiled by a retino-choroidal infiltrate, but no vitreous web or opacities. The veins were large, dark and tortuous to the limit of the ophthalmoscopic field. The irides reacted promptly, the anterior ciliary vessels were dilated, the anterior chamber of normal depth. The corneas and lenses were apparently transparent to oblique illumination or by transmitted light.

A solution of sulphat of hyoscyamin was prescribed to be instilled at home three times daily, and smoked glasses to be worn for protection against the light. The following day the pain in his head disappeared and with his correcting glasses V=6/V1 in each eye. It is my habit as a part of the daily routine in refraction work to use the ophthalmometer as a part of the preliminary examination before the use of the cycloplegic; and after the choice of a glass by the subjective method to make a critical study with the skiascope, using a plane mirror, with +2.00 D. behind it, at half a meter. The glasses selected by this patient had given him 6/V1 vision with each eye, and the skiascopic mirror study was in full agreement. But, I noted in the illuminated pupillary area, a dotted ring, concentric with the margin of the illuminated pupil, but separated from it, and on careful focussing the inclosed space exhibited innumerable fine dots. I had not observed this phenomenon before and sought to discover the exact location of the dots and ring; but to my surprise, could see them by oblique illumination only with the loupe.

The correcting glasses were prescribed, but because of the uveal conditions the mydriatic was continued for a week or longer. The uveal conditions improved rapidly, the retino-choroidal infiltration cleared up, the anterior ciliary vessels became normal, and the ring of dots disappeared. When present, the ring moved with the cornea in all directions and without parallax. The conclusion finally reached was that this granular ring was in the membrane of Descemet, or possibly only in its endothelium, and was an extension forward of the uveal conditions; not a deposit on the surface as seen in serous iritis, but an impairment of its nutrition in the area of the corneal pole, and that it was of possible grave significance from the point of view of the corneal nutrition.

Since this observation, I have had many opportunities to verify the conclusion then reached. Indeed, I have been surprised at the many examples which have been presented for study, especially in school children with increasing refraction. In several cases there have been not only the granular ring or cloud in the cornea, but irregular diffraction shadows and whirls of light as are often seen in cases of commencing conical cornea. I have witnessed this appearance or the corneal cloud in several cases which had been under my own care for years,

where the meridians of the cornea had obviously changed after the correcting glasses had been worn comfortably for considerable periods of time; not only the degree of the astigmatism having increased, but the axis of the correcting cylinder formerly at 60° had changed to 45° or even to 30° in one case. There was marked asthenopia, uveal disease and the corneal ring and cloud as above described. The corneal nutrition had been impaired, the cornea softened and unable to resist the normal intraocular tension.

Many examples have been found in children, as I pointed out last May in a paper on "The Genesis of the Myopic Eye," presented by request to the Ohio State Medical Society. In many of these cases of increasing refraction the distension of the globe does not occur as posterior staphylomata, but as a stretching of the anterior segment, or thinning in the anterior scleral region, and they, almost without exception present the ring and granular cloud associated with the uveal disease, which is the significant underlying factor in the syndrome of increasing refraction.

So far as I know this observation is new, and I bring it before the Section in this very incomplete statement, not wishing at this time to give a detailed study of the numerous examples from case records.

CORRECTION OF IRIDODIALYSIS BY OPERATION.*

ALBERT E. BULSON, JR., M.D.,
F. A. C. S.

FORT WAYNE, INDIANA

Few of the textbooks on ophthalmology have anything to say concerning the correction of iridodialysis by operation, and those that offer any suggestions recommend removal of the bridge of iris, thus making an iridectomy with a broad base and leaving a large coloboma. Operations for the reattachment of the torn iris, or the fixing of the iris in a corneal wound at the limbus, have been condemned by numerous authors, tho I am pleased to note that Wood, in his System of Ophthalmic Operations, as also in the American Encyclopedia of Ophthalmology, admits being satisfied with the results of incarceration of the torn iris in a corneal wound.

Just why this procedure, which is known by the name of iridenkleisis, should have fallen into disrepute and be considered as a risky procedure is not quite clear, except that it is generally thought that iris entangled in a corneal wound is apt to set up irritation, glaucomatous conditions, and even purulent inflammations. In the light of our present knowledge we must assume that the inflammatory symptoms are due primarily to the entrance into the iris tissue of some infectious germ, and such a complication in a large measure has been overcome by our modern aseptic methods of handling injuries. If the wound is a solid one, and closed to outside infection, there can be little danger of inflammatory reaction, and this is evidenced by the fact that many cases of prolapse of iris following injuries or operations, with incarceration of the iris tissue in the wound, have made uneventful recoveries and remained free from irritative or inflammatory reactions for long periods of time. It would seem, therefore, that it is folly to offer any objections to the operative correction of iridodialysis by incarcerating the iris in a corneal wound, on the ground that it is not a safe procedure.

I have had occasion to operate three cases of traumatic iridodialysis to correct defects that were very annoying to the patients thru double vision, movement of the torn iris, or objection to the double pupil from a cosmetic point of view.

In the first case, operated a number of years ago, the patient had a large iridodialysis occasioned by a sharp blow upon the eye, and this was corrected by making a relatively large opening at the limbus, thru which the bridge of iris was drawn, and to

*Presented before the Chicago Ophthalmological Society, on October 13, 1919.

insure its permanent incarceration in the wound it was anchored by a stitch which also enclosed the conjunctival flap without leaving any iris exposed. In this case recovery was uneventful, and, while the pupil was drawn upward to a considerable extent, yet the result was very satisfactory to the patient as well as to me. The eye remained perfectly quiet for a period of some three or four years, after which the patient was lost to observation.

The second case was a similar one, but the iris was not anchored in the wound in connection with the conjunctival stitch and it went back into the anterior chamber, but was replaced later with satisfactory results, so far as known, tho the patient was lost sight of soon after the operation.

The third case was of more recent occurrence, and in this case, with a large iridodialysis due to trauma, an effort was made to incarcerate the iris in the smallest possible wound at the limbus that would permit the introduction of iris forceps. Liebrecht iris forceps were used, the bridge of iris was seized on its torn edge and drawn into the wound sufficiently so that there was but the slightest amount of prolapse visible. No stitch was introduced. The wound was touched with pure tincture of iodin, the eye dressed with sterile vaselin, and the resullting effect was exceedingly gratifying in that it left the pupil but slightly deformed, and corrected a condition that was very annoying to the patient,—a young lady of twenty years of age. The operation was performed on May 17, 1919, and within ten days the eyeball was entirely free from inflammation or even irritation, and it has remained so up to the present time.

To my way of thinking this operation should be more generally used for the correction of extensive traumatic iridodialysis. It is preferable to the complete removal of the bridge of iris which leaves a very large coloboma with its disfiguring effects as well as irritation thru the passage of too much light into the eye, and when performed under our present methods of surgical technic it offers little or no evidence of being what many authors term "a risky procedure."

The point I would make is that the opening at the limbus should be on the scleral side; it should be no larger than necessary for the entrance of a closed pair of Liebrecht's iris forceps; and the bridge of iris drawn into the wound should not prolapse beyond the conjunctival flap. I am under the impression that the application of pure tincture of iodin to the wound with its incarcerated iris has a tendency to prevent irritation, while at the same time it stimulates the reparative process.

CASE OF ACUTE TENONITIS

W. Gilford Dickinson, M.D.,

Syracuse, N. Y.

G. E. W., chauffeur, aged 29.

History: While driving a motor car at a rather high rate of speed very early in the morning, patient noticed that he had difficulty in moving his eyes from side to side. A few minutes following this he felt as tho his lids were swelling, and stopped the car to have the occupants look at them. The owner verified the patient's fears, and placing him in the rear seat, himself drove to the city, where the writer saw the case within two hours after the first symptom had appeared.

Examination: Very marked chemosis of both lids of either eye, extending across the bridge of the nose, firm and hard to the touch. Patient was at this time unable to voluntarily open the palpebral fissure. Upon raising the lids, with horn retractors, the globe of each side was red, swollen so that the conjunctiva extended over, and obliterated all but 5 mm. of corneal surface, and the external ocular muscles apparently fixed, as the voluntary movement was limited to excursions of about 4 mm. in any meridian. Ophthalmoscopic search of the fundus revealed nothing abnormal. The reaction of the iris was sluggish. Monocular vision was slightly below normal, probably due to the fact that it was taken while the lids were held apart mechanically. Binocular vision was not possible due

to the marked immobility of the muscles. The patient complained of no pain, but mentioned a feeling of pressure in the eyes.

COURSE: The patient was immediately taken to a hospital, put to bed in a darkened room and the following treatment instituted. Cold compresses for half an hour at intervals of two hours. Atropin instillations every hour, solution of 1%. Calomel two grains in divided doses. Sodium salicylat, ten grains every three hours. Hot water bottles to produce diaphoresis.

At the end of twenty-four hours marked improvement had taken place. The patient could now open the lids three mm., and reported that the pressure seemed relatively less. Dionin solution 5% was now substituted for the atropin and used every three hours.

At the end of another twenty-four hours the patient was discharged from the hospital, the chemosis of the globe entirely gone and that of the lids relatively reduced. There was no diplopia, and binocular vision was normal. Monocular vision was reduced to 6/9.

The patient continued his trip, wearing protective glasses, with instructions to report in four days by letter. This he did, writing that there was no perceptible swelling of the lids, but at times he sees double.

The exigencies of this case were such as to make prolonged observation impossible, and it is reported with the full realization that its statistic value is greatly impaired thereby.

A NEW AXIS FINDER.

ALFRED COWAN, M.D.,

PHILADELPHIA.

The usual method of finding the exact axis of a cylinder (unless one possesses an expensive instrument) is by looking thru the lens, along the direction of the axis, at a line, and marking the points on the meridian thru which it passes without a break. The lens is then placed on a protractor and the exact axis found.

Not only does this examination require several steps and time in order to procure the axis, but it has several other disadvantages. It is not always possible to mark the cylinders accurately; it is necessary to have a glass marking pencil or special ink; the protractor is usually of paper and is easily soiled. For these reasons, many ophthalmologists are not as careful in examining their lenses as they should be.

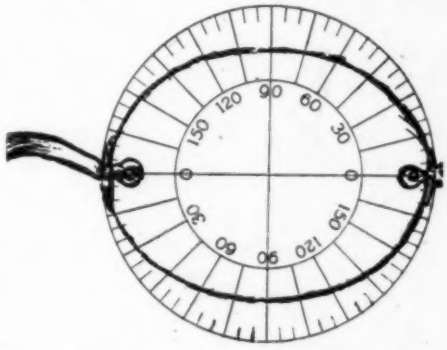

Fig. 1.—Cowan's axis finder applied to spectacle lens to determine axis.

The new axis finder is nothing more than a small round transparent protractor, small enough to be placed directly upon the mounted spectacle or eye glass lens to be tested. It may be made of glass or celluloid, either of which has its advantages and disadvantages. I have had some made of celluloid because of its cheapness and because it can be bent to conform to a toric lens. However, celluloid is less transparent than glass and scratches more easily. It can be kept in the trial case or vest pocket.

The finding of the exact axis or the center of a lens is now extremely simple, as it eliminates all but the very first step. This small device is now placed in position on the lens to be examined and by looking thru both at the same time the proper meridian noted at once.

ETHYLHYDROCUPREIN POISONING.

WILLIAM C. FINNOFF, M.D.,

DENVER, COLO.

It is a well known fact that certain individuals have an unusual idiosyncrasy for quinin, or its salts, when they are taken internally. But poisoning by the small quantity that is absorbed thru the conjunctiva in a state of acute inflammation, or from the overflow thru the tear apparatus into the nose, is exceedingly rare.

The following case occurred in a young man, aged 23 years, who had a severe bilateral conjunctivitis. Stained smears of the secretion revealed the pneumococcus. The patient was instructed to wash the eyes thoroly with boric acid solution every two hours, and follow it with the instillation of a drop of 1% optochin (ethylhydrocuprein), into the conjunctival sac.

Thirty-six hours after the first instillation of optochin the conjunctivitis became aggravated and the lids more swollen. A fine vesicular rash which resembled an urticaria appeared on the face and neck, and on the back of the hands. The patient suffered with a severe headache and some ringing in the ears.

On questioning the patient it was learned that he was very susceptible to quinin, and had developed toxic symptoms several times after the administration of very small doses. The optochin was discontinued and a 10% solution of argyrol substituted, which was followed by rapid improvement of the conjunctivitis with a disappearance of the rash and the headache.

SOCIETY PROCEEDINGS

Reports for this department should be sent at the earliest date practicable to Dr. Harry S. Gradle, 22 East Washington Street, Chicago, Illinois. These reports should present briefly the important scientific papers and discussions.

BELGIAN OPHTHALMOLOGICAL SOCIETY.

November 30th, 1919.

Translated by Dr. M. W. Fredrick.

Wound of the Superior Rectus.

M. M. LEPLAT, Liège, showed a man who had been struck in the left eye with a knife a year previously. The blade had entered just above the outer end of the eyebrow and had penetrated into the orbit. A week after the assault the knife point bent on the flat was recovered from the wound. Leplat saw the patient a month later and found incomplete ptosis, the eye turned downwards, diplopia beyond 35°, fundus intact. As there was no improvement Leplat tried an advancement of the superior rectus in September, but was unable to carry it out, as the part of the muscle which was accessible had been changed into cicatricial tissue which was adherent to the globe.

There is more than an insufficiency of the superior rectus to be considered, as the eye is displaced downwards. The author thinks that the knife point bent on itself pushed the eye downwards with great violence, tearing the check ligaments of the superior and internal recti, thus accounting for the permanence of the ectopia of the globe. To remedy this condition the author intends to pass a double-armed thread thru the stump of the superior rectus as far back as he can, and to lead the threads along the sides of the levator muscle as far as the orbital margin, where the needles are passed thru the skin and the threads fastened to the forehead. In this way he hopes to raise the eye and to keep it in its new position by means of cicatricial bands which will form around the threads and adhere to the periosteum of the orbital margin.

A Case of Traumatic Glaucoma.

THIBERT, Liège, presented a case of traumatic glaucoma coming on two weeks after a simple contusion in the neighborhood of the upper lid. The onset seems to have been favored by unusual physical exertion with the body bent forward, the eye being predisposed to increased tension by the contusion. The increased tension was of 42 days' duration, without change in the pupil or contraction of the visual field. While in the recumbent position the tension was 12 millimeters higher than in the sitting position. This difference is explained by the greater flow of blood to the head, the eye having lost its power of vasomotor regulation. Under the same conditions normal persons show no increase of tension, so that one is forced to assume a lesion of the sympathetic ocular center of the eye. In all probability there was a tearing of the zonula of Zinn. The origin of the glaucomatous symptoms is to be sought in the vasomotor paralysis which gave rise to a repletion of the choroidal and ciliary sponge with hypersecretion of aqueous humor and obstruction of the different lymphatic vessels.

Hole in the Papilla.

VAN LINT, Brussels. A painter, thirty years old, showed an absolute central scotoma, of small size, the result of a retromacular hemorrhage. With the ophthalmoscope an atypical excavation in the temporal part of the papilla was discovered, occupying about one-sixth of the entire papillary surface. This excavation bore no relation to the macular lesion, and was probably congenital.

Varicocele of the Orbit.

VAN LINT showed patient of thirty-five with the classical symptoms of varicose dilatation of the veins of the orbit, with intermittent enophthalmus

and exophthalmus. Operation was indicated by the pains accompanying the exophthalmus. Discussing the latter case Lagrange stated that in a similar case he had opened into the orbit thru a Kroenlein boneflap and resected a large piece of the ophthalmic vein. One cannot take the whole vein out, but by removing several branches and replacing them with fibrous tissue the ebb and flow in the vein, which give rise to the intermittent exophthalmus, is brought to a standstill.

Hemiatrophy of the Face and Ocular Symptoms.

WEEKERS, Liège, reported a case of hemiatrophy of the face in which a chronic recurrent irido-cyclitis was also present. Both conditions were due to a lesion of the trigeminus. The author calls attention to the pathogenic importance of the trigeminus in certain forms of irido-cyclitis. In the case reported the pathogenesis is evident on account of the coexisting skin and bone lesions, but the relation is not always so pronounced. That this is a fact is proved by the number of cases of postgrippal neuroparalytic keratitis which occurred during the epidemic of influenza which raged after the conclusion of the war and the signing of the armistice. The corneal lesions showed wide varieties, but many of them were associated with iritis and irido-cyclitis. In some cases the corneal lesions were so slight that they were overwhelmed by the severity of the irido-cyclitis. The pathogenesis of this form of irido-cyclitis easily escaped recognition. A consideration of these facts leads to the conclusion that there exists a form of irido-cyclitis due to an alteration in the nutrition of the globe with the trigeminus as the underlying cause. It is readily understood that an infectious disease like influenza may bring on an irido-cyclitis directly thru microbic metastasis in the uvea, a lesion of the trigeminus being the precursor.

Conclusion: In the presence of these rather frequent forms of irido-cyclitis with unknown etiology one should not forget a possible lesion of the trigeminus, and to look for the symptoms which indicate a lesion of this nerve, such as anesthesia of the cornea, of the skin of the forehead, etc.

Suture of Orbito-ocular Wounds and Deep Regional Anesthesia.

DE LAPERSONNE, Paris, advises the use of a primary suture in all orbito-ocular wounds that are quite recent. To better define the time he gives less than twenty-four hours for ocular wounds, and less than forty-eight hours for orbito-palpebral wounds. In all these cases methodic local or regional anesthesia is called for. The solution used to produce the anesthesia is an adrenalised 4% novococain solution with the following formula:

Novocain 0.08
Adrenalin 1/1,000 ..... 2 drops
Distilled water ..... 2 cc.

Put up in sterilized ampoules.

To produce anesthesia of the globe a straight needle is inserted 3½ centimeters beyond the inferior orbital margin, following a vertical line drawn from the external commissure. Entering at the level of the bone the needle is continued upwards and inwards, crosses the optic nerve and reaches the apex of the orbit in the neighborhood of the ciliary ganglion. The direction of the point is changed slightly and two or three cc. are injected into the cellular tissue surrounding the ganglion and the ciliary nerves. After a wait of 15 minutes the operation may proceed.

Anesthesia of the sensory nerves of the orbit is produced as follows:

1.—For the nasal a needle four and one half centimeters long is introduced just below the pulley of the superior oblique and pushed to the apex of the orbit following the superior internal angle. Two cc. of the solution are injected.

2.—For both the frontal and the lacrimal nerves one injection is enough. One should not try to reach the nerves at the apex of the orbit but at the top where they come thru the sphenoidal fissure at the external part. Closely following the external orbital margin and just below the external palpebral ligament a needle four and one half centimeters long is inserted in contact

with the bony external wall which bends backward and inwards.

3.—For the suborbital the point of entry is one and one half centimeters below the infraorbital margin, at the middle of the palpebral fissure. The needle directed upwards and inwards will strike a small depression in the bone, the foramen infraorbitale. When this is entered the patient feels a sharp pain in the teeth and the upper lip. In some cases one has to reach the superior maxillary in the orbital groove by pushing the needle along the inferior wall to the apex of the orbit.

This regional anesthesia is supplemented by lesser injections under the conjunctiva. Subcutaneous infiltration in forehead, cheek, and temporo-malar region make veritable barrages. The use of these is apparent when we consider that recurrent terminal branches of the inferior maxillary nerve are distributed to this, the skin of the last-named region.

Improvement of Our Surgical Armamentarium.

LANDOLT, Paris, has for years been busy with the improvement of our surgical armamentarium in his characteristic serious and logical way. Instead of trying to change a few instruments whose shortcomings are obvious he has gone to the root of the question by seeking what is peculiarly adapted to ocular surgery, and in what this differs from that which is useful in general surgery. To do this he has established the leading principles of ocular surgery, whence the form and the use of the instruments would follow. His basic ideas are: the organ with which we are dealing is so small, so sensitive, so mobile, and the operations practised on it so minute that our instruments as well as their manipulation require a delicacy and a precision much beyond the requirements of general surgery. Many of the instruments in general use are too heavy and too gross; the catches in certain forceps are too stiff to be operated without effort, thus defeating the delicacy demanded by the character of the operations. To obtain the precision and sureness demanded by ocular surgery the fifth finger should rest on the orbital margin and the bulbs of the other fingers should be very near the active part of the instrument. This is not possible with the present form of most of our instruments, as the distance between the handle and the active part of the instrument is much too long. The author exhibited a number of instruments modified according to these views, and accentuated their advantages by comparing them with the improper models in general use. For instance, the handles should be of aluminum slightly adherent, clinging instead of slippery, heavy steel; they should also be rectangular instead of square. Bistouries, curettes, cystitomes, Taylor loops, etc., should all have short, flat handles, lying well in the hand; the author's lance should have a short, curved handle, with the blade shaped like the ace of spades instead of a triangle. Rather short forceps, some with teeth set obliquely, and all with very soft catches, were also shown. Special mention was made of the author's needle holder, which had no catch, but graduated pressure; his palpebral plaque which follows the outline of the globe exactly and stretches the lid equally in its entire width; his syringe for injecting into the nasal canal, short and easily handled; his needles for muscular advancement, and his double curved scissors for enucleation, which do away with the muscle hook.

The author regrets that the efforts of a single individual are insufficient to change custom and bring about the changes so desirable in our armamentarium, and invites the profession at large to associate themselves with him in suggesting and demanding rational instruments from the makers.

Decompression Operation in the Treatment of Chronic Glaucoma.

LAGRANGE, Bordeaux. The decompression operation which reduces hypertonus is the subconjunctival fistulisation of the anterior chamber. This can be achieved in various ways, and the question is as to which is the

best way. The choice is determined by the anatomy of the sclero-corneal limbus, where we find a sclero-corneal ring 1.75 mm. wide if we measure from the zone of detachable conjunctiva to the summit of the angle of infiltration. This ring should be divided into two zones, a sclero-corneal zone, and a properly socalled scleral zone. This latter has a width of one millimeter, and it is in this that the excision should be practised.

There are three reasons for restricting the scleral resections to this zone: 1. It is best to operate in the sclera only, as this tissue is fixed in its form and not disposed to proliferate. 2. It is just over the filtration zone, which is the lattice work, as it were, in the trap which covers the canal of Schlemm. 3. By keeping to this region one avoids wounding the cornea which might choke the orifice with its granulations, and one respects the ciliary body which reacts violently when irritated. There are, therefore, anatomic, physiologic and surgical reasons for selecting this place for the fistula, and a piece one millimeter in width, at the most, and two or three millimeters in length should be resected with scissors, Graefe knife, and punch; the trephine should not be used, as its action cannot be confined to the scleral band, and it is apt to slip over to the ciliary body or the cornea. The author showed in several specimens how often and how seriously these two bodies are injured by the use of the trephine.

Passing from the choice of method the question arises whether fistulisation of the anterior chamber is really accomplished, and whether a durable normalisation of the glaucomatous eye is obtained. The author is very positive on this point, and asserts that it is indeed rare that the operation of sclerecto-iridectomy, according to his method, does not give the desired normalisation; the resultant scar is sometimes flat, sometimes ampulliform. When an ampulliform scar results, and this is often the case (seven times in the last sixteen cases which the author has to add to those already published) an orifice is visible which undoubtedly establishes communication between the anterior chamber and the subconjunctival spaces. To prove this Lagrange has twice cut into the ampoule and seen the anterior chamber empty itself in a few minutes. The author feels justified by an experience of sixteen years in asserting that decompression of the glaucomatous eye is invariably accomplished by subconjunctival sclerectomy in the limbus, and warns against the use of the trephine.

Contribution to the Trephining of Elliot.

HAMBRESIN, Brussels, has practised trephining according to Elliot forty times. He cuts a large flap thru the entire thickness of the conjunctiva, taking care not to touch the limbus, anl always sews the flap. The day following the operation a strong solution of atropin is instilled. He has never had a single complication which might bring the operation into discredit. In his statistics he includes only those cases which he has been able to follow up for a year. In simple glaucoma 55% of cures resulted. In chronic inflammatory glaucoma the results were very encouraging. Six out of seven cases that were trephined were cured. He always does a total iridectomy. In acute glaucoma trephining is highly advantageous. It can be done under local anesthesia, is not dangerous, and can be carried out when the anterior chamber is absent and the pupil dilated to the maximum. There is no troublesome bleeding while doing an iridectomy, and the postoperative astigmatism is reduced to the minimum. The author has also trephined in a case of bilateral hemorrhagic glaucoma; in these cases one should touch the iris as little as possible.

DISCUSSION.—Leboucq, Gand, does not doubt that the sclerectomy of Lagrange, and the modifications of this operation introduced by Elliot and others, often produce an improvement in glaucoma, but he thinks that the principle on which it is based calls for caution. The principle is: the increase of tension is due to an obstruc-

tion to the elimination of the aqueous humor; that the obstruction is removed by an opening in the sclera thru which the aqueous may escape. Laboratory researches are not necessary to prove the inexactness of this view; by purely clinical methods one can determine: 1. In most cases of glaucoma the anterior chamber is reduced in size, in many to nothing; there is, therefore, no obstacle to the outflow of the aqueous. 2. Some eyes on which a sclerectomy has been done remain soft even after the opening has closed; others get hard again very soon after the operation before the opening has had time to close. The fistula, therefore, supposing that it did exist, which is a matter of grave doubt, seems to play a very unimportant part. In former times we used to swear by iridectomy, the operation which made Graefe famous. Statistics showed surprising results, but the modus operandi of this irrational operation could never be explained. Then iridectomy was decried as useless and something else invented. Today the fashion demands sclerectomy; well, let us go ahead with our sclerectomies.

Lagrange, answering the preceding gentleman: "Our colleague says the anterior chamber is often obliterated in glaucoma, and the elimination of the aqueous is very easy. He says he cannot understand why under such conditions one should make so much of the faulty excretion of the aqueous in the pathogenesis of glaucoma, and then reports cases of sclerectomy by trephining which have been so eminently satisfactory. I shall answer seriatim his three points, as they seem to embody all his objections.

1. The anterior chamber is suppressed in glaucoma when the aqueous has been secreted in abnormal quantities in the region of the ciliary processes; the swollen vitreous pushes the lens forward, the iris is crowded against the cornea, Fontana's space is obliterated, and to the hypersecretion of the aqueous is added a defective elimination. There is nothing there which is not perfectly clear.

2. The pathogenic theory of glaucoma is no longer obscure; it was laid down by Donders; the glaucoma has its start in an excitation of the sympathetic vasomotor setting up a hypersecretion in the gland of the aqueous humor. Just as the cheeks flush when one has been insulted, just so the ciliary nerves of the glaucomatous subject speed up after a deep emotion or an excitement of a psychic, moral, or physiologic nature. In the beginning there is always some nervous excitement underlying every glaucoma, and all glaucomatous subjects have a neuropathic strain in them. After an eye has been the seat of several outbreaks the media are altered, and the filtration angle is clogged with waste, dross and debris of dead cells and extravasated blood cells; the drain at the angle of filtration ceases to play its part. To the hypersecretion is added hypoexcretion, especially in angiosclerotics in whom the sclera is very rigid and the vessels without elasticity. Hypersecretion thru excitation of the sympathetic hypoexcretion in angiosclerotic eyes, such are the features of the pathogenesis of glaucoma; and there, again, there is surely nothing obscure.

3. There is no gainsaying the fact that trephining gives results, and I take pleasure in accepting this as further proof of the value of the fistulising method. But it exposes one to accidents which I need not again enumerate, and these accidents, many in number, consisting either in infection or wounding of the ciliary body, should convince the partisans of the fistulising method that the safest method is that which uses scissors, knife, and punch to remove the piece of sclera. I prefer, naturally, my own method, but there are a number of others of merit, such as those of Holth, Jacqueau, Coppez, Ferroni, etc. Trephining is the most defective method for producing fistulisation."

Observations With Gullstrand's Lamp.

GALLEMAERTS AND KLEEFELD, Brussels, showed a series of drawings representing the normal and abnormal aspects of the anterior parts of the eye, as seen with Gullstrand's lamp.

Projection of Cinematographic Films.

H. Coppez, Brussels, showed:

1. A film lent by Barraquer of Barcelona, depicting Phacoerisis, which is a new method of extracting the crystalline lens with the aid of a suction cup which engages the anterior capsule of the lens.

2. Coppez then showed a film demonstrating the way in which ocular accidents occur in the porphyry quarries. The different categories of quarrymen are shown, and the visual requirements for each category are given. He lays special stress on the careless manner in which these workmen protect their eyes, with poorly fitting glasses and lenses which have become half opaque by numerous scratches. Besides, some of the quarrymen, such as hewers and rippers, are required to make such violent body movements that the wearing of protecting glasses is out of the question. A detailed paper will be written later on this very interesting subject.

3. Coppez presented four miners with generalised nystagmic neurosis; the particulars in these cases were furnished by Dr. Rutten who had these men under observation.

Wound of the Cornea by a Chestnut Burr.

Leplat, Liège, reported a case which is rather rare in this country, that of a wound of the cornea due to a chestnut burr which had fallen off the tree. Eight spines had penetrated into the cornea, two passing entirely thru that body. The extraction was easily accomplished with the aid of a cataract knife, and the eye healed rapidly without complication.

Genesis of the Atypical Central and Paracentral Colobomata.

Van Duyse, Gand. The fissural origin cannot be denied since the histologic analysis showed retinal folds at the edge of these colobomata (1898). Referring to the deep atypical retroequatorial pit found by him in the embryo of a calf in 1900, and the lesser ones found by Szily, Wolfrum, and Meissner, the author wonders whether in a microphthalmic eye a peduncular artery (which sometimes gives off two or three branches) might not on leaving the optic groove give rise to a secondary pitting in the annular fissure at the anterior border of the retinal calyx thru a branch anastomosing with the hyaloid plexus. There are other anatomic considerations besides a fissure between the two layers of the secondary ocular vesicle which might explain the nature of some colobomatous areas: 1. Aplasia of the pigment epithelium of the choroid, as seen in a chick embryo by Seefelder; 2. A lacuna in the pigment epithelium thru which the choroidal mesoderm has proliferated and then spread out in the subretinal space (Bergmeister); 3. Localized proliferation of the glia disuniting the pigment epithelium to reach the aplasic choroid (G. M. Van Duyse), all of which give rise to colobomatous areas of atypical character in the colobomatous eyes of the microphthalmic or cyclopean kind.

Chondroepithelioma of the Lacrimal Gland (Mixed Tumor).

Brandes, Antwerp, and Van Duyse, Gand. The tumor first showed itself in 1911, the first symptom being a slight adduction of the left eye with intermittent diplopia. In the neighborhood of the orbital lacrimal gland a small hard mass could be felt; this was movable, not painful to the touch, and not adherent to the skin. The history of the patient was negative, no neoplastic antecedents, no syphilis or tuberculosis.

The tumor did not show any progress until 1917, when it began to grow so rapidly that the eye was forced out of the orbit. When Brandes again saw the patient in December, 1918, the tumor had increased to the size of an orange, the eye was lying on the cheek, but no arterial pulsation could be felt in the tumor.

Brandes made a large incision thru the eyebrow, detached the orbital fascia and came upon a well encapsulated tumor, soft, and nonadherent. It was an easy matter to shell it out of the orbit, and after checking the bleeding and

sewing in layers healing took place per primam. The eye was not touched, and after replacing it in the orbit it was held in place by a pressure bandage. At the end of six weeks the functions of the eye had returned to normal. The eyebrow had grown back, and there was no trace of the surgical intervention.

Having thus removed the tumor in toto from the orbit Brandes questions whether a local recurrence might occur, or whether this tumor might give rise to metastases. Van Duyse examined the tumor and described it as a chondroepithelioma with preponderance of the epithelial elements. It is the latter component which makes one fear a recurrence.

Two Cases of Glaucoma From Homatropin.

HAMBRESIN, Brussels, reports the histories of two women of about forty-eight, with three diopters of hypermetropia, in whom acute glaucoma came on after instilling homatropin. In both cases the pupil was of average width before the homatropin was instilled, the reflexes were good, and there was no sign of hypertension. Both cases were treated with trephining according to Elliot's method, with total iridectomy, and both recovered. The predisposing causes were age and hypermetropia. A further study of the different mydriatics used to produce mydriasis for ophthalmoscopic examination (cocain, homatropin, euphthalmin), shows that they may all give rise to acute glaucoma in a predisposed subject.

DISCUSSION.—Lagrange, Bordeaux, then remarked: "I would like to say to our colleague that I consider it very exceptional that glaucoma may be caused by a mydriatic, and I base my opinion on the fact that in the clinic of Bordeaux we used homatropin even to excess in the courses on ophthalmoscopy, in spite of which I have never seen a case of glaucoma supervene. Before me Badal used atropin freely to dilate the pupil; during the twenty-seven years I was in his service not a single case of glaucoma occurred. The real reason for the outbreak of glaucoma in Hambresin's patients is neuropathy, a peculiar excitability of the sympathetic, roused into action by the excitement of an ocular examination. One remark struck me very forcibly, that he could not consider an iridectomy in these cases of acute glaucoma. To me it seems that iridectomy is always the operation indicated in acute glaucoma; this is one of the clinical standbys that we owe to von Graefe, and I think it poor judgment to make a clean sweep of the results obtained with this operation. The road of progress is hard and long enough, and we should carefully treasure what we have acquired. Acute glaucoma, iridectomy; sclerectomy should be reserved for chronic glaucoma. This is a point which I shall never tire of insisting on."

Trepanation of the Os Unguis and Placing of a Rubber Drain in Chronic Dacryocystitis.

VAN LINT, Brussels. The skin around the lacrimal sac is anesthetised by subcutaneous injection of a 1% solution of cocain. The mucosa around the middle turbinate is anesthetised with 10% cocain. A gauze pledget is packed into the middle meatus to prevent wounding of the septum by the trepan. A skin incision similar to that made for extirpation of the lacrimal sac is made, and the edges of the wound held apart with Meller or Axenfeld retractors. The lacrimal sac is incised from top to bottom towards its outer end with a bistoury, thus laying the sac wide open. The anterior and internal walls are then excised. The retractor is then removed and the trepan placed in the lower part of the cavity in such a way that the handle rests on the middle of the superior arch. In this position the os unguis is perforated with rotatory movements of the trepan. The gauze packing is then removed from the nose. The ensuing hemorrhage is stilled by passing a strip of gauze in a Pean forceps which is passed thru the opening made in the os unguis under the guidance of a pair of dissecting forceps passed from above thru the opening. When the bleeding

has been stopped a rubber drain four or five millimeters in diameter with a flaring upper end is attached to the gauze strip with a silken thread and the strip is drawn into the nose by an assistant. The drain is in place when its end is visible in the aperture. The silken thread is then cut, the gauze strip cut thru as it enters the sac, and what remains is drawn thru the nose. To prevent further hemorrhage the nose is plugged with gauze strips. The drain is shortened in the sac, the wound closed by endermic suture, and a pressure bandage applied. On the following day the bandage is renewed and the gauze removed from the nose. The patient is warned against touching the drain. After the fourth day the dressing is omitted. On the eighth day physiologic serum is injected thru the lacrimal point, and the drain is withdrawn on the tenth to fifteenth day. For several weeks the lacrimal injection should be continued every week thru the newly formed lacrimal passages.

New Observations of the Occupational Nystagmus of Miners.

RUTTEN, Liège, in explanation of the film shown by Coppez of four miners with generalised nystagmus, stated that this condition represents a disturbance of the equilibrium, and is not due to insufficient illumination nor the abnormal position of the eye during work. Nystagmus of the body may even exist without ocular nystagmus, and may be accompanied by motor troubles of the eyelids, of the muscles of the face, the neck, the trunk, the limbs, sometimes even by a hypoesthesia of the skin and mucous membranes, hemeralopia, photophobia, amblyopia, functional depression of the other organs of sense, and, lastly, trophic disturbances.

CHICAGO OPHTHALMOLOGICAL SOCIETY.

November 17, 1919.

Compensation for Loss of Vision.

DR. HARRY S. GRADLE, on behalf of a committee submitted a temporary scheme, as a basis of compensation for partial or total loss of vision; which could be utilized until such time as the committee of the Ophthalmological Section of the American Medical Association made its report.

There were several fundamental things that were to be decided on as absolutely essential, before formulating a basis for compensation. First, all vision is to be measured at a distance of twenty feet, using the illiterate E chart of Snellen.

The committee was making up a series of charts recording vision of 20/20 up to 20/200. Second, at least two months shall elapse between the disappearance of the last visible trace of inflammation and the time of examination upon which the report is to be based. In other words, an injury to the eye is to have as much chance as possible to quiet down. Third, the best possible vision, with or without correcting glasses, shall be used; provided there be not a difference of more than 4 D. spherical refraction between the two eyes. If the difference is more than 4 D. spherical refraction, the best vision of the injured eye without glasses shall be the basis of compensation. Fourth, normal vision is considered as 100. Industrial blindness is 20/200 or less, and shall count as 10. Loss of an eyeball shall count as zero. In other words, the committee decided that 20/200 be the least possible vision with which the average individual can carry on his occupation; that industrial blindness does not entitle an individual to the same compensation as complete loss of an eyeball. The individual gets 10 per cent for losing an eyeball in addition to loss of industrial vision.

The vision is recorded by the Snellen test, corresponding to visual efficiency in terms of 100, and the inverse of that or the visual loss in terms of 100.

The State law fixes the amount of compensation approximately to one year's salary. If a man has been injured in one eye and his vision is 20/40 for that one eye, he has a visual efficiency of 89 and is entitled to 11 per cent compensation.

Dr. Gradle submitted the following table:

TABLE

Vision	Visual Efficiency	Visual Loss
20/20	100	0
20/30	94.5	5.5
20/40	89.0	11.0
20/50	83.5	16.5
20/60	78.0	22.0
20/70	72.5	27.5
20/80	67.0	33.0
20/90	61.5	38.5
20/100	56.0	44.0
20/110	50.0	50.0
20/120	41.0	59.0
20/130	36.5	63.5
20/140	32.0	68.0
20/150	28.5	71.5
20/160	23.0	77.0
20/170	18.5	81.5
20/180	14.0	86.0
20/190	12.0	88.0
20/200	10.0	90.0

He said there are many considerations apart from the vision in the injured eye; but the present state laws and the present Industrial Commissions did not see fit as yet to recognize other things, such as vision to the uninjured eye, stereoscopic vision, and so forth.

The report of the Committee of the Ophthalmological Section of the American Medical Association would take into account all factors, and he hoped this final report would be accepted by ophthalmologists thruout the state.

He submitted the present report in the hope it would be of some value in helping the members out in their industrial work.

Interrelation Between Eye, Ear, Nose and Throat Cases.

Drs. Joseph C. Beck and Emil Deutsch read a paper, published in full in this Journal, p. 349.

Discussion.—Dr. Robert von der Heydt said the case of neuroparalytic keratitis following injection of the Gasserian ganglion was interesting. Cases that did not follow this operative procedure were very rare. He had one last year at the infirmary and Dr. Lane saw it with him. It was practically the only case they ever saw of neuroparalytic keratitis, that was not produced by operative procedure.

He asked about the vision in the other eye, of which this girl complained. She said that for a time she saw poorly in the other eye. He wanted to know the ophthalmologic diagnosis of the condition in that eye. If there was no lesion found there, this would possibly bear a little heavily toward a psychic diagnosis for the original trouble.

Dr. Emil Deutsch said there was no characteristic diagnosis of the condition of the left eye. Vision in the left eye is now 20/25 with glasses—a myopic eye. There was nothing unusual in connection with the next case. It was one of typical interstitial keratitis except that it took an ophthalmologist to diagnose the deafness. She complained three months of deafness gradually coming on. On examination Dr. Pollock found enlarged tonsils and adenoids, and as many cases of deafness had been reported as having cleared up following the removal of enlarged tonsils and adenoids, he removed them, and found after waiting a few months her deafness persisted, and then he concluded it might be a case of otosclerosis and took an X-ray picture which, however, showed negative.

They had given fourteen or sixteen adrenalin injections, which showed occasional improvement in hearing, until she presented herself with a sore eye and complained of something in it. One of the interns diagnosed the condition as conjunctivitis and gave her argyrol to use. The patient returned within three days with hearing very bad and her eyes getting worse. He was called to see the case then and made a diagnosis of interstitial keratitis, for the reason that in the posterior surface of the cornea there was an apparent opacity; vascularization distinctly seemed to be worse than ever before.

He recalled a statement made in one of the textbooks that during the stage of interstitial keratitis the hearing, if due to lues, was always worse. So in looking over her physiognomy for characteristics of lues, the nose, fore-

head, face and teeth were all negative, and she had no symptoms which would lead one to suspect a luetic condition. Spinal puncture was made and without waiting for the result of laboratory finding they gave her small doses of neosalvarsan with the result that her hearing began to improve until today she had about six or eight injections. Her hearing was practically normal now.

As to the eye he could only say that for interstitial keratitis, treatment with neosalvarsan was not very successful. The administration of neosalvarsan in her case proved very beneficial because she could not tolerate any form of mercury or iodid of potassium. The interstitial keratitis and hearing cleared up nicely by this treatment alone. Her vision was 20/50, had gradually improved, and the central opacity in the cornea might clear up further.

Dr. Clarence Loeb in connection with the case of neuroparalytic keratitis, reported a case he saw at the Michael Reese Dispensary of a woman, 40 years of age, who presented herself with ptosis on the left side, and the only history he could obtain from her was that it followed shortly after injection in the cheek for neuralgia. It occurred to him, if this case was the result of the injection of alcohol the operator must have taken quite a roundabout way to get the third nerve, and it seemed to him it should have produced more destruction in its path than it did.

He asked some of the members to speak of the possibility of such a condition following the injection of the Gasserian ganglion.

Dr. George F. Suker, in reference to the nerve case, said that in these cases examination of the teeth usually disclosed the characteristic syphilitic markings in the six year molars—the Darier-Fournier-Hutchinson molar. This patient showed such molar markings. Perhaps the deciduous teeth showed these syphilitic markings, and if so, the permanent incisors frequently escaped the characteristic markings. The patellar reflexes in interstitial keratitis were more or less reduced, but never entirely absent. The interesting feature in this case to his mind was the fact that this condition had cleared up under neosalvarsan treatment. He would necessarily take it to be the parenchymatous or nodular form of interstitial keratitis, and not the striated or linear type. The striated type was not affected by any form of antiluetic treatment one might institute. Scrapings of the cornea in the parenchymatous or nodular type in dark field illumination, often showed the spirochetes and in such cases antisyphilitic treatment was of special value.

Dr. Suker said that up to the present time no trophic nerve fibers had been isolated, i. e., fibers governing nutrition pure and simple. As this was still a mooted question, neuroparalytic keratitis was somewhat of a misnomer. The fifth nerve was not necessarily the one which carried the nutritional fibers, as far as we knew. Howell, of Baltimore, was not at all sure that the fifth nerve carried socalled nutritional fibers. That it was a trophic disturbance in the true sense of the term, nutritional — yes; but that these changes were due to nutritional nerve fiber involvement—no.

He asked Dr. Beck why he did not do decompression under a local anesthetic. The result might have been somewhat different. One could do very large decompressions under apothesin, without any pain whatever. It was not unusual for patients, with face down, under a general anesthetic to have respiratory difficulties which did not necessarily obtain when the operation was done under a local anesthetic, like apothesin.

Dr. A. A. Hayden stated that in the first case of neuroparalytic keratitis Dr. Beck was particularly fortunate in having so favorable a result as he had in regard to the right eye. The speaker had had the opportunity to see at least one case of neuroparalytic keratitis, following injection of the Gasserian ganglion with alcohol, in which removal of the eye was necessary.

Dr. Beck. In regard to the case whose brain was on the table, the hearing was absolutely gone on that side. He suggested that, instead of turning tests to establish the function of the labyrinth, caloric tests be made, as they would have been much easier to make and much less distressing to the patient.

Dr. Suker spoke of using a local anesthetic. He wished he had done the operation under local anesthesia, but it was not possible to have the consent of the patient, or that of her husband to do so. As to the mobility of the tumor, he looked up the literature, and neither Sir Victor Horsley or any of his associates of England, nor Cushing of this country reported any case of such looseness of a tumor as shown in this case. He reported three or four years ago his own brother's case (Dr. Rudolph Beck); in which at the postmortem examination, made by Dr. Herzog, the tumor dropped out of its own accord, as he (Herzog) removed the brain; but there was an attachment by the pedicle which had torn away. This tumor was loose and it could be explained how in the change of position of the patient pressure on a vital spot or center could take place and cause death. Whether it did or not, he did not know.

In reference to ulceration of the cornea following Gasserian ganglion operations or injections, he had seen two cases in which not enough care was taken in the protection of the eye, and the probabilities were there was a primary infection of the eye.

In regard to the Wassermann test, the point was well taken. For himself he had established the rule of making a routine Wassermann in all cases newly admitted, and was astonished in some cases to get a positive Wassermann and response to treatment when he least expected it.

Retinitis Proliferans.

Dr. Raymond R. Harrington (by invitation) reported this case. The patient, Peter M., aged 25 years, presented himself to the Illinois Charitable Eye and Ear Infirmary, August 1, 1919, and was admitted to the Remmen Service. The speaker was the first one to see the patient and to examine him. About eight months ago, while over in France, he was wrestling and during the engagement he became suddenly totally blind in the left eye. He did not report the incident to the medical men in charge, for fear of not being permitted to go to the front. Several days thereafter he told a physician friend of his blindness and was advised to take K. I. Vision was totally absent for several months and he was discharged from military service by memorizing the chart.

Examination revealed R 20/15; L. 20/40; tension R 23-L. 20. Cocain, 4 per cent. was instilled into each conjunctival sac until full dilatation was present. Examination of the right fundus showed the disc very well outlined, veins and arteries clearly perceptible, white lines prominent, vessels clear and distinct, the region of the macula clear and distinct. Examination of left fundus proved more interesting. The first view obtained showed a large white crescentic line running from below the disc, across the disc, and at temporal disc outline, branching off into a Y-shaped affair. The disc itself was perfectly clear, with a +2.00 D. lens. Veins of normal proportion, arteries the same, white lines showing very clearly. The fundus was very much infiltrated with hemorrhages, but there seemed to be none in the region of the macula, which was perfectly normal.

Patient was seen once more, but failed to appear again. No diagnosis was made at this time except a tentative one of rupture of the choroid. No blood vessels appeared over this white line, but one could see them go to the border and then reappear on the other side.

On November 5, 1919, patient again came to the dispensary claiming that it appeared to him as tho a veil were thrown across the right eye. At that time vision was R 20/15; L 20/30; no pain. Blood pressure, systolic, 125; dyastolic, 70; Wassermann, 100 per cent. negative. The eyes were

again dilated with cocain and homatropin. Fundus of right eye normal and same in appearance, as when the speaker saw it last August. Fundus of left eye showed hemorrhagic spots practically absent; macula clear but the white line or band still present and of same size and character. This time both band and disc were clear—but when +6.00 was used band was brought forward and was very distinct, while disc was back and hazy. Upon close examination with a +6.00 there was only one minute blood vessel crossing the band and that was close to the disc. The other vessels seemed to run under.

Under homatropin and cocain the trial case shows — R + 1.00. Sph. L — 0.25 Sph.

Patient is wearing glasses and seems perfectly comfortable. In this case the speaker was unable to elicit a retinitis (vasculitis or perivasculitis) as so many authors claimed to exist before a retinitis proliferans occurred.

Coloboma of Sclera and Hernia ot Choroid.

Dr. Harrington. A patient, aged two months, was brought to the Infirmary by a visiting nurse. The baby was born August 1, 1919; normal delivery, after eight hours of mild labor. Ever since birth the mother had noticed a small tumor mass on the right eye, to the outside of the pupil. At times, the mass seemed larger than at other periods, more so when the baby cried.

Child was well nourished. Tension in both eyes equal and normal. Small tumor mass on right corneo-scleral margin, about 10 mm. in the horizontal direction, and about 8 mm. in the vertical. Mass was of an epithelial character, no external growth of hairs. Neoplasm was not hard nor soft; it moved in any direction, even tho it seemed to be partially attached to the cornea. Pupil responded to light; ciliary body intact. Diagnosis a dermoid tumor. Operation and removal of the tumor was advised, to which the mother readily gave her consent.

The baby was placed on the operating table and cocain 4 per cent administered. The tumor was strongly adherent to the cornea and also to the scleral conjunctiva, but a distinct attachment to the same. Dr. Lebensohn and the speaker decided to begin the operation by removing the mass from the corneal surface. Slow sharp and blunt dissection was resorted to; the hemorrhage was profuse; they dissected the tissue about 2 mm. from the corneal scleral margin, when the color underneath changed from a white glistening one to a light blue. At first, they did not know what was before them, then decided it was the choroid, and as the baby was moving around to such an extent that operation was impeded, they thought it best that a general anesthetic be given. Light ether narcosis was produced, and again the operation proceeded. The covering was slowly dissected up and now choroidal tissue was plainly seen. The remainder of the sac was easily dissected off, and now one could easily see an absence of sclera and hernia of the choroid. They could easily reduce the hernia but found the coloboma was so great the edges could not be coaptated. Too much tension was deemed out of the question as they might alter the fundus condition.

The conjunctiva on either side of the hernia was dissected back for about one-half inch and a mattress suture applied. Then the overlapping edges were brought together by interrupted sutures. Bichlorid ointment was applied and a pressure bandage. The eye remained covered until three days after the operation, when the bandage was removed, and there was no inflammatory reaction. Twelve days after the sutures were removed and to date the conjunctival flap seems to be serving the purpose. The hernia was about four millimeters in diameter.

Discussion.—Dr. Michael Goldenburg said he would like to hear the members discuss what should be done for coloboma. Should an attempt be made to close it up or permit it to remain? The probabilities were that if nothing was done to close it up the opening would result in closure as the

child grew up. He suggested that the transplantation of fascia might close it up permanently, altho he had never tried it. It appeared to him as a possibility.

ALFRED N. MURRAY,
Secretary.

MINNESOTA ACADEMY OF OPHTHALMOLOGY AND OTOLARYNOLOGY.

January 9th, 1920.

President, DR. J. S. WHITE.

Industrial Blindness and Compensation.

DR. SAMUEL G. HIGGINS of Milwaukee, as guest of the Society, read a paper on "Industrial blindness in relation to the Workman's Compensation Act." This talk covered practically the same ground as Dr. Higgins article in the AMERICAN JOURNAL OF OPHTHALMOLOGY. (v. 2, p. 813.)

DISCUSSION.—Dr. Frank Burch expressed the opinion, that the question as to whether the amount of vision left the workman after injury would permit him to continue with the work for which he had been especially trained, should be taken into consideration; as should that of diplopia and the possible subsequent exclusion of the impaired eye. He thought that special consideration should be made in those cases in which a man with one amblyopic eye sustains an injury to the "good eye," that charts should be standardized and that the question of limitation of the visual fields should be taken into consideration.

Dr. J. D. Lewis brought up the question of central injuries to the cornea, leaving opacities which destroyed central vision but did not impair peripheral vision; stating that when peripheral iridectomy was performed in these cases it was followed by diplopia. He cited one case in particular in which he had advised against it.

Dr. Robinson, of Duluth, called attention to the fact that the State Supreme Court had ruled that the condition of the uninjured eye had nothing to do with the case, altho this would appear to the layman to be a palpable injustice.

Dr. Morton emphasized the importance of the peripheral fields of vision and urged the adopting of uniform charts with a uniform system of illumination.

Dr. Boeckman expressed the opinion that the old Snellen test letters should be supplanted by the broken ring test; which, having no relation to language or literacy, could be standard the world over. It being "unlearnable" was a further advantage.

Dr. Higgins in closing the discussion laid stress upon the fact that it was necessary to avoid the tendency to be "ultrascientific" in the consideration of this matter. The industrial commissions in the various states were interested in it from a practical standpoint only and looked to the ophthalmologists of the country to get together and agree upon a simple, practical plan of estimating the impairment, one that should so far as possible be entirely fair to the employer and the injured man.

It is, of course, understood that the amount of disability cannot be worked out with mathematic exactness. It is the personal opinion of the conscientious and competent doctor that is wanted by the Commission. Dr. Higgins said that the effort was being made to arouse the interest of oculists in this important matter in order to establish a working basis upon which we could all agree, and which could be accepted by the various State Commissions as representing the consensus of opinion of the profession.

ARTHUR EDWARD SMITH,
Secretary.

COLORADO OPHTHALMOLOGICAL SOCIETY.

December 20, 1919.

DR. H. M. THOMPSON presiding.

Meibomian Granuloma.

G. F. LIBBY and W. C. FINNOFF, Denver, presented a woman aged 36 years who had originally consulted Dr. Finnoff in June, 1919, because of a granulomatous swelling of the left upper lid margin. At that time the patient had been treated for several

weeks by the family physician, the treatment consisting of squeezing, and there was a little pus superficially, making the condition appeared as tho it had been a hordeolum originally. It looked a little like a granuloma. Dr. Finnoff cauterized it with the actual cautery, and it improved considerably. When examined by Dr. Libby on December 20, 1919, the center of the left upper lid margin presented a swelling the size of a small split pea, protruding about 2 mm. from the free edge of the lid, and slightly scabby. There was no discomfort, but the patient felt that the growth was unsightly. The case raised a question of differential diagnosis between granuloma, syphiloma and epithelioma.

Discussion. W. H. Crisp, Denver, suggested that the condition was purely a chronic irritation secondary to chalazion, and that it would yield to radical treatment, that is to say opening up each of the swellings present, both inside the lid and at the lid margin, and thoroly cleaning out the diseased tissue.

C. E. Walker, Denver: In such cases I have been in the habit of making an intermarginal section along the edge of the lid, making a V-shaped opening, and removing the tissue entirely.

A. C. Magruder, Colorado Springs: In these indurated conditions, before resorting to any such measures as Dr. Crisp has suggested, I have used massage and heat.

H. M. Thompson, Pueblo. I have found it beneficial to express all the ducts, by squeezing the two lids together.

E. R. Neeper, Colorado Springs: With me it is a regular practice to squeeze the edges of the lids together, and I have not run across anybody else who does it. I place the right thumb above the upper lid, and the left thumb below the lower lid, and press the two inner surfaces of the lid margins together. It is surprising the amount of material one gets. By going over the lids two or three times in this way one can often restore the secretory function of the glands.

Keratoiritis of Traumatic Origin.

G. F. Libby, Denver, presented a man of 62 years who had had a fair-sized corneal ulcer, of apparently traumatic origin, which was healing satisfactorily. The ulcer was of eight weeks' duration, but had been under special treatment only eleven days. The vision of this eye was reduced to 5/80, altho that of the right eye was 5/7.5. Satisfactory healing of the ulcer had followed light but thoro cauterization with nitric acid at the first visit; but a week later, very severe pain developed and the pupil ceased to be widely dilated, altho there were no adhesions.

Discussion. E. R. Neeper,Colorado Springs: I think the keynote of these cases is to get at the physical causal relations which will admit of the development of the condition. To size the man up by his appearance, I should think of his intestinal tract. In dealing with these ulcers, we probably always as a matter of routine examine the upper lid. Contact of the lid with the abnormal corneal tissue may start more or less roughness of the lid epithelium. As an ulcer case progresses, if the lid takes on such a boggy condition as this lid presents, I frequently wind cotton on a toothpick, and rub the roughened tissue of the lid freely.

W. H. Crisp, Denver, felt that in such sluggish cases, where there was not a socalled neuropathic etiology, a focal infection was to be looked for.

H. M. Thompson, Pueblo, suggested that the condition of the patient called for the use of eliminatives and tonics.

Removal of Lens from Injured Eye.

D. A. Strickler, Denver, presented a boy of 7 years who on August 7, 1918, had been injured by the explosion of a dynamite cap with which he had been playing. Both eyes were severely injured, the left so seriously that it was removed at once. The right eye had repeatedly failed to show foreign bodies by the X-ray, but a low grade inflammation had persisted for a long time. The fundus had never been seen, but there were white masses in the vitreous. Cataract had later de-

veloped. The eye was at present relatively quiet, and there was light perception with good projection thru a widely dilated and fixed pupil. The case was presented for suggestions as to the advisability of removing the lens in the present condition of the eye.

DISCUSSION. C. E. Walker, Denver. There has probably been a great deal of iridocyclitis, the color of the iris being greatly changed. As there is not too much irritation at the present time, it might be a good thing to do something with the lens. If the lens is left alone there might be a persistent iridocyclitis and destruction of the eye.

Edward Jackson, Denver: The eye is, I believe, one that fully justifies an attempt to get a clear pupil, by removal of the lens. It would be freer from risk of subsequent reaction if the condition were left for six months or a year more. There may be an opacity in the vitreous off to one side, altho the peculiar way in which the lens is broken up makes this uncertain. I recently saw a case, in a man who had been slowly developing senile cataract, in which almost within a day or two the sight of the better eye was almost completely lost. The history was such that I thought the man must have suffered an intraocular hemorrhage, but on examination no serious complication had apparently arisen. I extracted the lens, and across the middle of it was a place which looked as tho the lens had ruptured within the capsule, with a rapid increase of opacity. I believe that in Dr. Strickler's case something of this kind may have happened. The promptness of light projection makes it quite hopeful that the patient will have useful vision, but to give him the best chance I believe he should wait some months or a year.

Paralysis of Motor Oculi; Sudden Recovery.

D. A. STRICKLER, Denver, presented a man aged 31 years who between September 3 and September 14, 1919, suffered from headache of increasing severity over the left side of the head and settling over the left eye. On September 10 vomiting occurred, lasting about thirty minutes. On the night of September 14 the left eye closed. When the patient first came for consultation on the 17th of September he was found to have complete paralysis of the left third nerve. The dilated pupil contracted slightly to light, but not to accommodation. The vision of the right eye was 20/50, corrected to 20/20, that of the left eye without correction 20/100. The fundus was negative. Wassermann test was negative, and X-ray examination was negative as to the sinuses. On October 13, the middle turbinate was removed, and the posterior ethmoid and both sphenoid sinuses opened, all of them seeming normal. There was no apparent improvement in the condition until about November 10, when the pain rather suddenly ceased and the diplopia disappeared. At the time of report the vision of either eye was normal, but there was exophoria of 14° at twenty feet and of 24° at thirteen inches, and a slight insufficiency of the left inferior oblique muscle.

DISCUSSION. Edward Jackson, Denver: We ought to mention in connection with this case a condition which has probably given rise recently to more scattered literature than any other affecting the eye, namely *lethargic encephalitis*. I think that I have seen one atypical case of this condition. The four things which are most typical of the disease are a very gradual onset, some fever, oculomotor paralysis, and the condition of lethargy. But in about twenty per cent the lethargy is absent. The ocular paralyses are irregular, sometimes come suddenly and go suddenly. In the case I saw there was a distinct history of diplopia lasting one or two weeks, then clearing up, and again coming on. The larger proportion of the cases have recovered, altho more of the fatal than of the light cases would be reported. While this is not clearly one of those cases it is not clearly in any other class of cases that cause oculomotor palsy.

More frequently decided weakness of the muscles remains for several weeks. There is a very strong tendency of these cases to get better. In

the cases that come to autopsy there is an infiltration in and around the vessel walls in the brain, and not much meningeal involvement. I think this condition has not been enough in the minds of doctors, either oculists or others. The case I saw I referred to a neurologist, who tried very earnestly to convince himself that the condition was syphilitic. She is, however, a married woman with a large family of children, in all of whom and in herself there is no clinical evidence of syphilis. Lethargic encephalitis is probably a specific disease, except that a good many cases have had a previous attack of influenza. About 1890 and 1891, in Italy and Austria particularly, occurring after that great epidemic of influenza, cases were reported, and two hundred years ago cases apparently similar were reported after attacks of influenza.

G. F. Libby, Denver, mentioned two cases of transient oculomotor paralysis which had been referred to him by Dr. M. Kleiner within a period of three days. The first was in a boy of 14 years who had been suffering from pneumococcic tonsillitis for three days, when there developed sudden dilatation ad maximum of both pupils, accompanied by ptosis of the left upper lid. Accommodation and muscle balance were unaffected. The ptosis disappeared in four days and the pupils became normal in eight days. Three weeks later the mother reported that the right pupil had dilated once only and that there was slight ptosis temporarily if the child became very tired.

The second case was in a man of 56 years. He developed ptosis of the left upper lid and paralysis of the left inferior rectus, one day after severe gastrointestinal disturbance, which had followed marked indiscretion in eating. In this case also the accommodation and the pupils were not affected. The left eye turned 2.5 mm. higher than the right, and required a 20 degree prism to overcome the resulting diplopia. Both the ptosis and the diplopia disappeared after six days, and fifteen days later they had not reappeared. In each case a diagnosis of toxemia affecting the oculomotor nerve was made, and a correct prognosis of early recovery was given.

F. R. Spencer, Boulder. In these cases, in addition to focal infection, one has also to think of syphilis and tuberculosis, and of the gastrointestinal tract.

C. E. Walker, Denver. When I cannot find that there is a focal source of infection in the tonsil, the nasal cavity, or the digestive organs, I refer these cases to a genitourinary specialist, and have found sometimes that infections in the prostate gland were giving the same kind of trouble as we sometimes find from the tonsils or the teeth or the nose.

H. M. Thompson, Pueblo. I should hesitate to attribute a third nerve paralysis that exists for any length of time to an intestinal intoxication, and I believe it is also rare with a focal infection. I get the impression that these cases of lethargic encephalitis usually follow influenza.

Drusen of the Disc.

E. T. Boyd, Denver showed a man of 44 years, with perfectly normal vision, each of whose optic discs showed a number of glistening masses of the kind commonly known as drusen.

Discussion. Edward Jackson, Denver. In nearly all the cases I have seen the drusen have been located in other parts of the fundus. The vision was also usually more or less reduced where the condition appeared on the disc, altho this was not true of the cases where it appeared to be on the choroid. As I recollect, the vision has also usually been more or less reduced where the condition appeared on the disc, altho this was not true of the cases where it appeared on the choroid. In one case in a young woman I watched the development for several years in the choroid at the macula. Finally the vision did come down to perhaps ¾ or ⅔ of normal. In the case presented, it looks to me as tho the discs were distinctly congested and as tho there were some other exudate besides the drusen.

Dust-like Persistent Pupillary Membrane.

J. M. SHIELDS, Denver presented a man aged 28 years whose eyes were normal except for a deposit of brownish, dust-like particles on the anterior surface of each lens. The particles were extremely numerous, fairly evenly distributed, and much more abundant in the left than in the right eye. There was also a minute tag of brown tissue at the upper inner pupillary margin of the left eye. The personal history was negative, with the exception that the patient said that he had had very sore eyes when five or six years of age.

DISCUSSION. W. H. Crisp, Denver, suggested that the case was probably one of an unusual form of persistent pupillary membrane.

Copper Wire in Anterior Chamber.

A. C. MAGRUDER, Colorado Springs, reported further concerning a lad of 17 years who had been shown to the society almost four years previously, on account of what was then called a Vossius ring, following an injury to the right eye by collision with the edge of a door. The patient was seen again on October 15, 1919, on account of marked inflammation of the same eye, probably an iridocyclitis. This inflammation cleared up very slowly. On December 7, a black linear object was for the first time seen lying in the anterior chamber, one end anchored at six o'clock, and the other end free and movable at about nine o'clock. No history of a foreign body having got into the eye was obtainable. On December 16 it was removed with much difficulty thru a keratome incision under local anesthesia, being finally secured by seizing it at its middle. It proved to be copper and resembled one of the fine strands of copper contained in insulated electric wire. It measured 1 cm. in length.

Iridocyclitis.

A. C. MAGRUDER, Colorado Springs, reported a case of iridocyclitis in a negress aged 41 years. The right eye had been injured seven years previously from the explosion of a coffee pot; and when the patient was first seen on November 25, 1919, was a soft blind eye, but neither painful nor inflamed. Disturbance in the left eye was said to have begun early on November 25, 1919, and the eye showed marked signs of iridocyclitis, including adhesions of the iris to the lens, and very numerous minute deposits on Descemet's membrane. The blind eye was removed on Dec. 1, the patient having previously been placed on KI and mercurial inunctions. There was rapid improvement of the left eye, the corrected vision on December 18 being 20/20, altho the deposits on Descemet's membrane had not cleared up.

DISCUSSION. E. T. Boyd, Denver, was disposed to believe that the condition in the left eye was specific in character. It was not probable that a sympathetic inflammation would have cleared up so rapidly after the removal of the offending eye.

Remains of Hyaloid Vessels.

W. H. CRISP, Denver reported a case of persistent remains of the embryonic system of blood vessels between the optic disc and the crystalline lens, in the right eye of a woman of 29 years. The vision of this eye with correction was 5/10 plus. The eye was hyperopic almost 3 D., whereas the other eye was hyperopic about 1.25 D., the vision of the left eye being 5/3 most. The remains appeared as a black strand wavy and fairly mobile extending completely from the disc to the posterior pole of the lens.

Multiple Ulcers of Lid Margins.

W. H. CRISP, Denver, reported a case of multiple ulcers of the margins of the left eyelids in a man of 43 years, a bank clerk by occupation. The patient was wearing reading glasses which relatively undercorrected hyperopia in the affected eye, and he also had four putrescent tooth stumps. The ulcers, three on the upper and two on the lower lid margin, varied in length from about 2 to 4 mm. They were shallow, and had slightly raised red edges. The patient was first seen on November 22, 1919, when only one ulcer had formed, and the lid had been inflamed for three days.

In spite of treatment, which included optochin every hour, atropin sulphat 1 to 120 three times daily, and applications of two percent silver nitrat and later of pure nitric acid to the ulcers, no tendency to healing was definitely shown until about two days after removal of the teeth, which took place on November 25. After this improvement was fairly rapid, and a week or so later the patient volunteered the statement that he felt much better in general health than for some time past.

Bilateral Abducens Paralysis.

W. H. Crisp, Denver, reported a case of apparently simultaneous paralysis of both external recti muscles in a woman aged 28 years. She had been delivered of a healthy first child about the beginning of November. About ten days after her confinement she developed a milk leg, and her temperature was above normal practically all the time for four weeks. Toward the end of this time phlebitis developed in the other leg in a milder degree. About four weeks after her confinement, after several days of terrific occipital neuralgia, diplopia developed rather suddenly. At the time of examination on December 19, 1919, the vision of each eye was about 5/9, improved to about 5/7 with correction. The movements of each eye were normal in all directions except outward, the right eye barely reaching the median line, and the left passing very slightly beyond the median line. The retinal vessels were slightly tortuous, the veins moderately distended. The right fundus showed one slightly narrowed crossing, the left fundus a number of short thick patches of exudate on the arteries. No distinct change could be made out at either macula. The urine was reported by the general physician to be negative.

Discussion. C. E. Walker, Denver, had reported a case somewhat similar to this last spring, in a young man who was running a temperature, and in whom paralysis came on first in the external rectus muscle and then in the other, and then existed in both muscles at the same time. A swelling which developed in the left temporal region was opened and drained, and subsequently the patient developed meningitis and died. The meningitis developed about six weeks after the operation on the temporal mass, and the whole case was of about six months' duration.

F. R. Spencer, Boulder. About ten years ago I saw a miner who had suffered a basal fracture, and who had an extreme convergence of both eyes about equal as regards either eye, and evidently due to involvement of the sixth nerve at the time of the injury.

Edward Jackson, Denver. The only case of clear bilateral abducens paralysis that I have seen was in a brakeman who got his head crushed between the buffers. I think it improbable that the double abducens paralysis in Dr. Crisp's case could arise from any localized lesion that would not cause other symptoms. It must be a toxic disturbance of the nuclei.

A. C. Magruder, Colorado Springs. Last summer in Colorado Springs I saw a patient who had been running a low grade temperature for some weeks, and whose eyes were crossed. The fundi were absolutely normal. About a week later I saw a notice of her death from meningitis.

W. F. Matson, Denver, recalled a case of basal fracture in which the eyes were crossed, and in which it took about a year for the right eye to swing out, while the left eye never did get beyond the median line.

Multiple Lacerations at Pupillary Border.

H. M. Thompson, Pueblo, reported the case of a boy of 13 years who had been hit in the left eye with a bean shot from a bean shooter. The case was unusual in that the sphincter of the iris was torn thru at intervals of about 2 mm., all the breaks in the muscle being of the same depth, and the pupil being 5 mm. in all diameters. The pupil reacted sluggishly to light and accommodation. There was also apparently a disturbance of the ciliary muscle, as the patient was unable to

read unless given a plus 2 D. sphere, altho distant vision was normal with a cylindric correction. There were two opacities in the lens, but the eye was apparently otherwise normal.

Sympathetic Iridocyclitis.

H. M. THOMPSON, Pueblo, reported the case of a girl of six years who on July 17, 1919, had suffered a severe lacerating injury of the left eye from a stone thrown by a brother at play. Enucleation was advised, but rejected by the parents. When the parents returned for the first time on August 2, the iris was of a greenish hue and the tension minus, and removal of the globe was again urged. The parents, however, returned home to Rocky Ford, and did not again report until August 14. The right eye was then slightly inflamed, there was marked photophobia, and the pupil was small and reacted sluggishly to light. At this time removal was agreed to, and was done immediately. After several weeks of moderate disturbance in the right eye, and in spite of treatment, this eye steadily got worse, the cornea and aqueous remaining clear, but the pericorneal injection persisting, the iris being slightly discolored, the pupil slowly closing, posterior synechiae forming, and the pupillary space filling with exudate. At the time of report the vision was reduced to fingers at four feet.

DISCUSSION. Edward Jackson, Denver. The majority of the cases which I have seen, and nearly all the cases which seemed to be irredeemably bad, have been in children, and the prognosis as regards sympathetic ophthalmia is much worse in children and worse in younger than in older persons. I believe that in any such case it is the duty of the practitioner to refuse treatment, if the parents will not consent to enucleation. This will give them the opportunity to get the same opinion from some one else.

W. H. Crisp, Denver, referred to a paper which had appeared in the literature concerning the influence of focal infections in these cases, and suggested as a forlorn hope that the tonsils and other possible sources of trouble should be investigated.

C. E. Walker, Denver, had recently had a very similar experience. At his office a visiting physician from the country had used the magnet for extraction of a piece of steel from one eye, and a little later in the summer the patient came in with an iridocyclitis in the other eye. Immediate removal of the first eye was insisted upon. But altho this was promptly done the last information about the patient was that there was barely light perception in the second eye. In reply to a suggestion that iridectomy should be tried in such a case, Dr. Walker said that as soon as the iridectomy was done in this class of cases the eye at once closed down. He even believed that the condition was hurried.

Dr. Thompson. I have looked this up quite carefully, and all opinions seem against opening the eye during the time of inflammation.

WM. H. CRISP,
Secretary.

SECTION ON OPHTHALMOLOGY COLLEGE OF PHYSICIANS OF PHILADELPHIA.

January 15, 1920.

DR. WILLIAM T. SHOEMAKER, Chairman

Unilateral Choked Disc.

DR. FREDERICK KRAUSS presented a case of unilateral choked disc in a ten-year-old boy. When first seen the right eye was blind with immobile pupil, except consensual reaction to light.

The disc was swollen about 6 diopters, with small hemorrhages, the other eye having a filled-in disc, rather too gray in tint. The swelling gradually disappeared, showing a membranous semitransparent mass lying across the disc at an angle of about 105 degrees, and a considerable area of choroiditis to the outer and lower side of the disc for about 1 and 2 disc diameters respectively. The vision is now 15/70, with a much flattened field. The opposite eye has a concentrically contracted field. The Wassermann test was negative, but improvement followed large

doses of iodid of potassium, so that a possible specific etiology was suspected.

Symmetric Macular Degeneration.

Dr. Burton Chance described the fundi of a man and his sister in which the macular regions were symmetrically affected. The lesions were discoid and rather sharply outlined from the surrounding retina by pigmented borders. In none of the eyes were there gross lesions elsewhere. The subjects were healthy Americans. Marked color vision defects were manifested by each. The man was slightly day-blind and had a convergent strabismus of low degree. The woman manifested an intermittent nystagmus. These cases are reported in full in this Journal, v. III, p. 241.

Hole in Disc with Bridge Coloboma of Choroid.

Drs. T. B. Holloway and A. J. Bertram (by invitation) exhibited a patient, F. V., aged seventeen years, who first came to the Wills Eye Hospital, October 8, 1919. The patient came to this country from Russia when six years of age. Prior to that time he vaguely remembers that his eyes were not perfect, but the first positive deficiency he recollects was when he reached quarantine in New York in 1908. His family history is negative.

Right eye: Cornea, iris and pupil negative. The disc is of somewhat irregular contour, the lower half showing a well-defined, broad groove, which slopes outward. Near the lower and outer margin of the disc in the grooved portion there is a characteristic hole, the outer border of which is somewhat pigmented, having a gray-green tint. A tiny vessel curves over the outer margin of the hole while two thread-like vessels can be noted coursing across the bottom. The depth of the hole is 3 D. The vessels emerge eccentrically from the disc up and in at the junction of the upper third and lower two-thirds. The capillarity of the disc is fair, except in its lower half, which is rather pale. At an apparent distance of about 11 mm. below the margin of the conus or of the partial coloboma at the nerve entrance there is a large disc-sized area of choroidal disturbance; this is a sharply circumscribed lesion. At an apparent distance of 11 mm. below this lesion can be noted the apex of a typical coloboma extending as far forward as the eye can see.

Left eye: Widely divergent. Cornea clear; the iris shows a well-defined, coloboma at seven o'clock. In the lens there is a well-defined, vertical rectangular opacity, 7x4½ mm. in size, in which can be noted possible calcareous changes. The lens has undergone partial absorption, and bridging across from the ciliary region to the lenticular opacity, are several pigmented strands. Beyond the dense opacity above described less involved lens material can be noted on the temporal side and below. Between the lens remains and the ciliary region on the nasal side one can get a poor view of some of the fundus structures and can note a large area extending downward and slightly inward, which gives rise to a reflex similar to that noted in cases of coloboma.

No operation was performed on the left eye and there is no definite history of trauma. The vision of the right eye is 6/9, of the left, L. P.

Concerning the hole in the disc, it was pointed out that this was situated in a groove in the portion of the disc usually affected. In referring to the etiology reference was made to the previous case report published by Holloway.

They referred to the classification of colobomata as cited by Coates, and felt that it was impossible to positively say whether a coloboma of the nerve existed in this patient, agreeing with von Hippel that ophthalmoscopic examination in these cases is not reliable in determining the pathologic anatomy involved. They called attention to the unilateral coloboma of the iris, not the slightest evidences of a defect being present in the right eye.

Bilateral Colobomata of Iris and Choroid.

Dr. T. B. Holloway exhibited and referred to the history of W. D., aged

twelve years, who first came to his clinic at the Wills Eye Hospital, August 25, 1919. The child's mother stated the eyes were known to be defective since birth. The irides were of piebald type. There was a mixed nystagmus. The child preferred to fix with the left eye.

Right eye: There is a coloboma of the iris directed down and slightly in, 2.5 mm. in width. Several delicate opacities can be noted in the lens. A few delicate zonular fibers can be noted below, stretching between the notched border of the lens and the ciliary body, but they are deficient in numbers. Examination of the fundus reveals a large coloboma, the apex sweeping just above the disc, the position of which is best determined by the emerging vessels. The course of the vessels is very irregular here and there, showing marked dipping. There are vague splashes of delicate pigmentation over the colobomatous area. An unusually large number of vessels can be noted coursing over the colobomatous area well toward the periphery; doubtless socalled scleral vessels.

Left eye: In the iris, directed down and in, there is a coloboma measuring 2 mm. in width. The lens shows the same characteristics described for the right eye, except that no zonular fibers could be noted except at the extreme angles of the colobomatous area. As in the right eye a few vitreous opacities could be seen. The coloboma of the choroid is of the same character as that described for the right eye.

Dr. Holloway referred to the occasional rotary movements of the head that occurred when the child attempted to read. He called attention to the vague or uneven character of the surface and referred to the ectasia that could be noted in one eye. He stated that he had never seen a case in which so many vessels coursed over the affected area.

New Pupillometer.

Dr. T. B. Holloway stated that until recently he had never found a satisfactory clinical instrument for measuring pupils. A year or more ago he had made a tentative design of what he though might prove of service. Recently he chanced to see a cut of an ordinary optician's lense gauge, which coincided to a marked degree with his previous ideas concerning a pupillometer. One of these instruments was obtained and has been used by him for several months. No modifications have been made except, as an experiment, the tips of the instrument were enameled, thinking that it might give rise to a greater contrast between the tips of the instrument and the underlying iris. He pointed out that the instrument was not only of service in accurately measuring the size of the normal pupil, which can be determined to a tenth of a millimeter, but that it was of the utmost value in determining the dimensions of oval or irregular pupils. It was likewise of the greatest service in making linear measurements on the globe or of lesions on the lids, also to determine the width of the palpebral fissure in cases of ptosis. He pointed out the splendid balance of the spring in the instrument, which was delicate enough for fine adjustment and yet stiff enough to permit rather free handling without changing the position of the indicator. He realized that a millimeter scale placed nearer the tip of the instrument would be of advantage, but the same degree of accuracy would not be obtained. Therefore he had been using the instrument exactly as it came from the shop, except for the enameled tips, and had found it the most satisfactory instrument for the purpose above described that he had ever used.

Fortunately it was an instrument that was used by practical shopmen, and, as a consequence, could be purchased for a price that was consistent with its actual value. In other words, it was free from the exorbitant price charged by most instrument makers.

History, Day-Book and Ledger Cards.

Dr. S. Lewis Ziegler brought up for discussion the subject of history, day-book and ledger cards. He thought that the practical side of one day's daily routine deserved more careful

consideration than was usually accorded it. He described the system that he had used for twenty-five years past and asked for suggestive criticisms and descriptions of other methods used by the Fellows. His history card measures 6x6¾ inches, and contains at the top a skeleton outline covering the routine items always recorded, viz., "No." "Date." "Name." "Residence." "Age." "Occupation." "Referred by." "Charge." "Duration." "Vision." "Accommodation." "Heterophoria." "Power of Muscles." "Glasses Worn." "History of Ophthalmoscopic Examination, Refraction, etc." A date column is ruled at the left side and the surgeon's name and address is printed in small type at the bottom. For lengthy histories supplementary cards are provided, having only a top line for name and a left marginal ruling for date. Fields, laboratory findings and other data are attached by clips to the history cards, separately or in manila envelopes. The cards are made by the Library Bureau of Boston.

He called attention to the need of keeping accounts for physicians in a manner that was convenient and met legal requirements. He had always used a combined day-book and ledger, which is a unit in itself. The pages are ruled with a wide space at the left side for the patient's name and address. This wide space is then subdivided into a three-line space running thru each day of the month, comprising debits, remarks and credits, arranged thus:

DR.
RMKS.
CR.

The daily charge and the daily credit are then entered up and an abbreviated description or code word of the operation or treatment is inserted in the square interspace between the figures. At the end of each month the total debit and credit are carried forward and a balance struck, from which bills can be sent out. Columns for these totals and balances are ruled at the extreme right of the page. It is optional whether these debits and credits shall be transferred to a small ledger card (3x5 inches), but it is very convenient to do so. It is also optional whether a compact bill-book shall be used or not, but this is also a most convenient form of making a rapid review of one's outstanding accounts.

This day-book and ledger has stood the "acid test" by being submitted to the Orphan's Court. The method was approved, the account confirmed and judgment awarded without argument or dispute. The book is made by Hoskins & Co., of Philadelphia.

He had always used a book of 400 pages, 14 names to the page, which was somewhat cumbersome to handle. He now proposed to use a loose leaf system of 200 pages, 13 names to the page, which would be more convenient. The pages, however, must be numbered in pairs to indicate their continuity. Thus, page 15 for the first half of the month would be opposite page 15 for the last half of the month. The surgeon's name should be printed at the bottom of each page to convey its identity.

The legal requirements are that the original entry shall contain names entered in sequence and that each charge shall be entered in figures instead of by code or check mark. Card systems for individual names are not legal. It behooves the profession to put its bookkeeping on a legal basis and insist on payment, just as the grocer or merchant does. The laxness of one injures the prosperity of all. Patients who do not pay cash should not be allowed to escape payment of a just bill for services rendered.

J. Milton Griscom, M.D.,
Clerk.

ABSTRACTS

F. Moreau, Alternating Pseudosyndrome. Ann. d'Ocul., 1919, v. 156, p. 151.

Under this title, Moreau, reports a case of fracture of the skull accompanied by left hemiplegia, right incomplete facial paralysis with ptosis, right exophthalmos and immobile eyeball, slight conjunctival and palpebral ecchymosis, hydriasis, with complete loss of pupillary reaction and vision, hemorrhage covering the nerve head. No loss of consciousness. Later loss of sensation of cornea and conjunctival, with myosis and doubtful reaction to light. The exophthalmos disappeared, and there was progressive emelioration of the immobility of the eyeball. The author believes that there was an antero-posterior fracture of the skull on the right side, terminating in the optic anal. A subdural hemorrhage by compression caused the left hemiplegia and entered into the sheath of the optic nerve causing the ocular symptoms.

C. L.

Fernand Lemaitre and **Maurice Brémond. Mucocele of the Ethmoid.** Ann. d'Oculist., 1919, v. 156, p. 475.

The authors report a case in a soldier, 19 years old. There was a large round mass, 3.5 cm. high, extending from the median line to the left eyeball. The latter was displaced temporaly about 2 cm. and anteriorly about 2 cm. Palpation showed a hard resistant mass. From the radioscopic and rhinologic examinations, a diagnosis of ethmoidal sarcoma was made. Operation, however, revealed a mucocele of the ethmoid, a rare condition.

C. L.

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THE INTERNATIONAL OPHTHALMOLOGICAL CONGRESS.

With the report made and adopted at the New Orleans meeting, the movement for a world Congress on Ophthalmology has taken definite shape; and has entered upon the stage of active development and preparation. The time suggested for it, April, 1922, leaves the period for preparation short enough, for there is much to be done.

Washington, where the Congress is to be held, is in many ways the American city best adapted for such a gathering. But it is expected that the guests who come from other countries to attend the Congress will be entertained in many of our cities, and will see something of America's material progress, resources, and scenery. It is time for American ophthalmologists to get busy. Some of the preparations for the Congress must begin at once, and be pushed vigorously to achieve the best results.

First we can support the Congress by joining it. The expense it must entail has already begun. A wide correspondence, both domestic and foreign, must be carried on, to extend the necessary invitations, and effect the preliminary arrangements. The member who now sends in his membership fee (ten dollars) in the Congress, will not regret that it is paid; and he will help when the help is most needed. He will, too, receive the bulletins that will from time to time be issued, keeping him in touch with what is being done in this organization in which all ophthalmologists, particularly those of America, should be actively interested. Probably no greater help could be given the Secretary of the Committee when he goes abroad next month, to attend the Oxford Ophthalmological Congress, than to enable him to announce that more members have already joined the Congress than the total attendance at the only other International Ophthalmological Congress held in America, at New York City in 1876.

Those who propose to offer papers for the Congress have little enough time to prepare them. The subject should be selected at once, all the available literature bearing upon it should be read, and the experiments that may

settle points that would otherwise remain in doubt must be made. The first reading will be likely to open up a much wider range of related literature than had before been supposed; or some important article may prove very hard to get. The experiments may have to be modified and repeated, or may require much more time than was at first expected. Pathologic specimens and slides may only yield the most valuable lessons when carefully restudied, after a considerable period of thought and investigation; or a sound judgment can be passed on them only after other specimens and slides have been studied, with equal care and thought.

The paper may not take five minutes to read; but its importance, the respect it will secure for its author, the permanence of its place in the literature, the benefit it will confer on the profession will depend on the breadth of reading, the depth of thought, the months and years of effort that have gone to its preparation. For any paper that is worth writing the actual time and labor spent upon its composition is only a minute fraction of the time spent upon preparation to write.

Even by those who only expect to discuss a paper, the same kind of preparation should be made. As the subjects for discussion are announced in the bulletins of the Congress, those interested should take up systematic reading on these subjects, should go to their case records and carefully endeavor to trace the later history of these cases; and should be able to present in their discussion accurately ascertained final results. The scientific success of our Congress, the importance of the place it will occupy in the history of ophthalmic progress, dèpend on the careful preparation made for its scientific proceedings, in the two years that are to elapse before it convenes.

A third kind of preparation, that will contribute greatly to the satisfaction of those who make it and also to that of our visitors, is study of the languages that will be used in the Congress, and in the volumes of its transactions. The "official languages" of the Congress will be English, French and Spanish. That means all papers and remarks in discussion, that will be published in the Transactions of the Congress, will have to be translated into one of these languages. Other languages also will be heard in the discussions.

It is quite possible for even a busy ophthalmologist in two years to get a good reading and listening knowledge of one of these languages, and even to master it so as to be able to communicate rather easily with a visitor who is wholly dependent upon it. The study of a language is so totally different from the ordinary care and worry of practice, that it will be felt as a recreation rather than a task to one who is interested.

To carry on this kind of study one should get a good grammar, should have lessons from some one who speaks the language; and should undertake to do some ophthalmic reading in it, to become familiar with the special words and phrases with which he is concerned. For the latter purpose the leading ophthalmic journals, particularly those that give considerable space to review matter; or a good recent text-book on ophthalmology in the language studied, will be of greatest service. Where there are two or three ophthalmologists living in the same town, they can take up the language study together; and will find it yet more interesting and valuable. This kind of preparation is not to be made for the Congress alone. The very moderate command of another language is preparation for communion with foreign colleagues, for travel abroad, for interesting and profitable reading thruout life.

The Committee to arrange for the International Congress has selected the following as its officers: Chairman, George E. de Schweinitz of Philadelphia; Secretary and Treasurer, to whom membership dues should be sent, Luther C. Peter, 1529 Spruce street, Philadelphia. Chairman of Sub-Committees: Finance, William H. Wilmer, Washington, D. C.; Organization, Edward C. Ellett, Memphis, Tennes-

see; Membership, Walter R. Parker, Detroit, Michigan; Scientific Business, Edward Jackson, Denver, Colorado.

The membership and organization of the various committees, both general and local, will probably be announced in a bulletin regarding the Congress at an early date. The undertaking is well begun, it is an important one, the time is short for what has to be done. Let us get to work and make the International Ophthalmological Congress of 1922 a scientific success, that will win respect for ophthalmology as studied and practiced in America; both from ophthalmologists thruout the world and from the general public, that too often fails to discriminate between the scientific worker and the charlatan. Let the committee know soon who in each city are actively interested, ready to join in the Congress, and to work for its general success, and the entertainment of foreign visitors who may visit that city or region.

E. J.

CATARACT OPERATIONS.

The series of papers published in our April number, dealing with questions regarding operations for cataract, illustrates the present thinking of ophthalmic surgeons about problems that have claimed a large share of the attention of their predecessors for 250 years. Nearly all the forms of cataract knife that have since been advocated by men whose names were employed to designate them, were used and described by the first generation of operators who followed Daviel. Yet they still continue to be forgotten, reinvented and tried again.

The fact seems clear that there are many slightly differing modifications of technic, any one of which may be adopted with success. Having mastered one of them and used it well, the surgeon should adhere to it and be slow to change. Having thought out his plan, and gained the skill in using it that comes only with actual practice, let him not give it up at the behest of the latest article describing a new (?) modification. Possibly among the large number of methods advocated a few will finally be judged better than his own; but for him, and his patients, the plan he has made his own by mastering it, will always be best.

Proposed variations in technic may be judged, however, by certain principles that are fairly well established. A simple technic is always to be preferred. This is often forgotten among the claims of novel and "improved" methods. The first question to be asked about a modification is, does it make the procedure more simple? If it does not, it should be regarded with skepticism. This claim of simplicity is the strong one put forth in one of the papers of the series referred to. Next after simplicity we would rank a smooth incision, then the conjunctival flap to guard against infection, and in general the least incision compatible with avoidance of bruising the tissues.

The discussion of special modifications and procedures is endless. It will go on wherever a paper on cataract operations is read before a society. We will not here enter upon it. But it needs to be reiterated that certain general surgical principles should dominate all plans. They must not be lost sight of in the enthusiasm for what is supposed to be new, and is hoped to be better; and within wide limits individual skill is more important than any special method.

E. J.

BOOK NOTICES.

American Academy of Ophthalmology and Otolaryngology. Transactions of the Twenty-fourth Annual Meeting. 8 vo. 484 pages. Illustrated. Clarence Loeb, M.D., Editor. Published by the Society.

About one-half of this volume is given to the 21 papers and discussions on subjects relating to ophthalmology. Several of these papers, and an abstract of the discussions are published in this Journal, as original papers and under the heading of Society Proceedings. They compare well with similar transactions of other societies, both as to novelty and practical importance.

The operative side of ophthalmology is particularly well represented.

The outstanding feature of the present volume, as compared with its predecessors, is the abundance of excellent illustrations. Some of the halftone reproductions are exceptional, both for their artistic beauty and for the clearness with which they demonstrate the points they are intended to illustrate. Even the crude diagrams tell their story more briefly and clearly than any verbal description. A new departure, for these transactions, is the color plate representing Dr. Love's case of cysticercus in the vitreous.

This volume contains in addition to its scientific proceedings and lists of officers: the minutes of the annual meeting, the Honor Roll of members who served in the late war, and lists of its members arranged both alphabetically and geographically. All these add to its current interest, and to its future value as a book of reference. The Editor is to be congratulated on the early appearance of this volume, less than six months from the date of the meeting, and on its excellent makeup. E. J.

Section on Ophthalmology, A. M. A. Papers to be Presented at the New Orleans Meeting. April 28-30, 1920. 8 vo. 225 pages, illustrated. Chicago, American Medical Association.

This paper-backed volume is unique in medical literature, both because it is a true presession volume; and because it is an instance of free distribution of the highest class of medical literature. It is printed by the American Medical Association and the authors of the papers; and given, postpaid, to those who receive it. The way to get it is to become a member of the Section on Ophthalmology, and attend its meetings at least once in five years, and register.

It is put out for the use of the members at the session. Of the 15 papers here printed we are supposed to say nothing. They are to be published later in the Journal of the A. M. A. and the Transactions of the Section. But we will venture to remark that they are all of high scientific value, and deal with topics likely to arouse interesting and valuable discussions, which will increase the importance of the Section Transactions. Their subjects are already announced in the program for the New Orleans meeting.

The introduction of blank leaves for memoranda makes this volume very convenient for use in the meetings. Its full value will only be appreciated by those who bring it with them. We urge all readers to get on the section mailing list, by attendance at the New Orleans meeting. E. J.

The Eye, Ear, Nose and Throat, edited by **Casey A. Wood,** M.D., D.C.L.; **Albert H. Andrews,** M.D.; **George E. Shambaugh,** M.D. Practical Medicine Series. 1919. 384 pages, illustrated. Chicago. "The Year Book Publishers."

Annually we welcome the Practical Medicine Series; particularly the volume on the Eye, Ear, Nose and Throat.

On each subject only the high lights are given. The ocular signs and symptoms of systemic and neighboring diseases are given preferential space, as is also Military Ophthalmology. Of these as prominent subjects, the reviewer is struck with Wyler's advocacy of canthoplasty in trachoma, the resort to which is comparatively often made in his own practise, disciform keratitis, focal infections, optic neuritis from nasal sinus disease, and the ocular muscles, toxic amblyopia. The ocular symptoms of general diseases, together with pages on injuries of the Eye and Military Surgery are other noteworthy abstracts.

To the diseases of the Ear, Nose and Throat is given the balance of the book. H. V. W.

A Practical Treatise on Ophthalmology. By **L. Webster Fox,** M.D., L.L.D. New York and London. D. Appleton and Company.

Of text books on the eye we have quite a few, the larger number being published in the English language, the majority by Americans, and a goodly portion of these arising from the "ca-

cothesis scribendi Philadelphiaenusis." To this good natured gibe at the activities of medical authors in the City of Brotherly Love, it may be added that these are of the best and among them is that of Fox.

This is a book which may be followed with safety, as it condenses the present knowledge of ophthalmology within the covers of a schoolbook, yet allows the author's individuality to show thruout its pages. We grant Fox a large experience and have followed his teachings for three decades with profit. The student may do no better!

The scheme of the work is classical, giving chapters on anatomy and physiology, bacteriology and general diseases having ocular lesions or symptoms, eye muscle imbalance and refraction comprehensive enough to give a working basis for the student.

The illustrations are largely original and of good quality. Those dealing with specific lesions are mostly from the author's practise. In describing operations weight is given to the ones preferred by the author, among them a number devised by him. Exactness of detail will be noted even to the proper method of holding instruments, which is shown a la Landolt in pictures of the surgeon's hands. The work is good and is recommended for a text book. H. V. W.

Symptoms of Visceral Disease in Its Relations to Clinical Medicine. Francis Marion Pottenger, M.D., L.L.D. 328 pages. 86 text illustrations. 9 colored plates. St. Louis: V. C. Mosby

In this book is given the interpretation of visceral neurology, a study of visceral disease from the important standpoint of the patient. It is an attempt to show how pathologic changes in one organ affect others, and the organism as a whole thru the medium of the visceral nerves, to which the author gives the name of the Vegetative Nervous System. An understanding of this system, and the activities of the endocrin glands will explain to the clinician most of the physical activities connected with the visceral functions. This is an attempt to show the relationship between physiologic facts and clinical observation.

Six pages are given to the influence of the sympathetic nerves on the eye, with numerous references to the eye thruout the body of the text.

H. V. W.

Medical Vademecum, in German and English. **B. Lewis,** Vienna, with preface by A. Politzer. 2nd ed. 559 pages. Vienna, B. Lewis.

Those of us not fully cognizant of colloquial German who had the opportunity to attend the Vienna clinics were materially helped by certain brochures and books published in both English and German. It has always been the writer's opinion that a large proportion of the professors at the German universities obtained most of their living from the fees paid by foreign students. For forty years Vienna was in the lead in the clinical advantages furnished post graduates in some branches of medicine and particularly so in Ophthalmology. Surely the want of American students since the beginning of the Great War has put the teaching faculties into the discard, from which they may never recover. The glamour of "study" in Europe no longer attracts the medical man and we may say that it is hardly now necessary for a finish to the student's career. The two books here reviewed are no doubt German propaganda, attempts to attract young Americans to the old Krankenhaus again,—where a few hours a day may be spent looking at sore eyes and dissertations thereon, —the balance in the Bierstube.

This bound book contains on the lefthand pages the German text, and on the right the translation into English; the latter a very good "ubersetzung" too. The subjects discussed are mainly clinical lectures in general medicine, the ones on the Nerve Tracts of the Central Nervous System by Marbourg, and on Diagnosis of Inflammatory Affections of the Cornea by Meller, being of direct interest to the oculist. These take up 241 pp., 149 pp. being given to colloquial Ger-

man with Histories. Tests, Examinations, Operations with Instructions to Patient and Assistant. Among these are the History of a case of Cataract with Operation, Testing of Vision, The Visual Field, The Astigmometer. The balance of the book is given up to examinations by means of chemical and microscopic methods which are up to date for all routine work.

The book is commended to those who do not read German well, and for use to students who may desire to go to Europe. H. V. W.

Vademecum for Otologists, by B. Lewis, Vienna, with preface by A. Politzer. Vienna, B. Lewis.

A paper covered book of 205 pp. containing articles pertaining to otology by various authors, the purpose being to make as easily accessible as possible to German and English otologists the medical vocabulary of both languages. The preface of 115 pp. consists of 7 lectures, the one by Barany on Dizziness and the semicircular canals of decided interest to the ophthalmologist. The balance of the book is devoted to Histories, Tests, Examinations, Advice and Operations with Instructions to Patient and Assistant, in German and English on opposite pages, of value to the English speaking student in Germany. H. V. W.

NEWS ITEMS

Personals and items of interest should be sent to Dr. Melville Black, 424 Metropolitan Building, Denver, Colorado. They should be sent in by the 25th of the month. The following gentlemen have consented to supply the news from their respective sections: Dr. Edmond E. Blaauw, Buffalo; Dr. H. Alexander Brown, San Francisco; Dr. V. A. Chapman, Milwaukee; Dr. Robert Fagin, Memphis; Dr. M. Feingold, New Orleans; Dr. Wm. F. Hardy, St. Louis; Dr. Geo. F. Keiper, LaFayette, Indiana; Dr. Geo. H. Kress, Los Angeles; Dr. W. H. Lowell, Boston; Dr. Pacheco Luna, Guatemala City, Central America; Dr. Wm. R. Murray, Minneapolis; Dr. G. Oram Ring, Philadelphia; Dr. Chas. P. Small, Chicago; Dr. John E. Virden, New York City; Dr. John O. McReynolds, Dallas, Texas; Dr. Edward F. Parker, Charleston, S. C.; Dr. Joseph C. McCool, Portland, Oregon; Dr. Richard C. Smith, Superior, Wis.; Dr. J. W. Kimberlin, Kansas City, Mo. Volunteers are nedeed in other localities.

Deaths.

Dr. Michael Behrman, Covington, Ky., died recently.

Dr. Augustin Chacon, Mexico, died Oct. 9, 1919.

Dr. Reginald Evershed, Hampstead, England, died Jan. 25, 1920, aged 55 years.

Dr. Edgar Lee Lindsey, Fort Smith, Ark., died March 8th, from pneumonia, aged 33.

Dr. W. T. Montgomery, Chicago, and Evanston, Illinois, died in Evanston, March 25th, 1920, aged 76.

Dr. James Pinkerton, West Kirby, England, died Feb. 16, 1920.

Dr. Barton Pitts, St. Joseph, Mo., died March 10th from heart disease, aged 60.

Dr. Frederick T. Reyling, Kansas City, Mo., died at his home Feb. 24th, 1920 from pneumonia, aged 59.

Dr. Samuel Doty Risley, Philadelphia, aged seventy-five, died April first, following a nervous collapse. Dr. Risley was one of the very prominent ophthalmologists of this country. He was Chairman of the Section on Ophthalmology of the A. M. A. in 1893; and a member of the House of Delegates in 1907; President of the American Academy of Medicine, in 1891; President of the American Ophthalmological Society in 1907; President of the Ophthalmological Section of the College of Physicians of Philadelphia in 1904; Lecturer and Assistant Surgeon in Ophthalmology in the University of Pennsylvania from 1872 to 1879; Professor of Diseases of the Eye in the Philadelphia Polyclinic from 1886 to 1900, and Emeritus Professor thereafter; Attending Surgeon to Wills' Eye Hospital since 1889; a member of the board of managers of the Pennsylvania Training School for Feeble-Minded; Alumni manager of the University of Pennsylvania Hospital since 1896. His death is a great loss to the ophthalmic profession of the world.

Dr. W. K. Rogers, Columbus, Ohio, died Feb. 27th, 1920.

Dr. E. M. Whitney, New Bedford, Mass., died Feb. 27, 1920, aged 64.

Personals.

Dr. Casey Wood has been elected Foreign Corresponding member of the Sociedad Oftalmologia Mexicana.

Dr. J. F. Dickson of Portland, Oregon, was a San Francisco visitor during the early part of April.

Dr. L. M. Harris, till lately a general practitioner of Superior, Wisconsin, has returned from a course of study on the eye, ear, nose and throat, and now is a specialist on those branches in the same city.

At a recent meeting of the New York State Medical Society, Dr. William Zentmayer of Philadelphia, opened the discussion upon papers by Drs. Duane and Thomson upon "Anomalies of Binocular Balance."

Dr. F. E. Woodruff, of St. Louis, has been appointed Chairman, and Dr. John Green, Jr., St. Louis, Secretary of the Consulting Staff of Oculists of the Missouri Council for the Blind.

Friends of Dr. Thomas Hall Shastid will be pleased to learn that he has so far recovered his health that he intends returning to practice. He will, however, continue to reside at Superior, Wisconsin, and his work will be confined to consultations and expert testimony in the field of the eye, ear, nose and throat.

At a recent meeting of the College of Physicians of Philadelphia, which was held as a memorial to the late Dr. Horatio C. Wood, Professor of Therapeutics, Materia Medica and Toxicology of the University of Pennsylvania, the principal address of the evening was delivered by Dr. George E. de Schweinitz of Philadelphia.

Madrid Correspondence speaks with great enthusiasm of Prof. Fuchs' work in Spain: "The case of Fuchs, who has always kept apart from all hatred, being a soldier only in the army which fights pain and disease, is tragic. An old man after retiring from his profession, and no longer able to replace what he has lost, he has been compelled to to abandon his country, bid goodbye to his family, and accept the offer of a few lectures. Still this scientist puts into his course an enthusiasm and we may say love which is full of life, and he demonstrates his anatomic specimens with so much pleasure and fervor that he seems to forget himself and rises to the serene heights of science." *Jour. A.M.A. v. 74 p. 961.*

Societies.

The Society of Ex-House Surgeons of the Manhattan Eye, Ear and Throat Hospital gave a dinner on the evening of April 17th in New York.

The Section on Ophthalmology of the New York Academy of Medicine on April 15th devoted the evening to a paper by W. Holland Wilmer of Washington, D. C. on "The Injurious Effects on the Eyes of the Various Toxemias."

The Medical Society of the State of California will meet in Santa Barbara, on May 11-12-13. Ophthalmology will play an important part in the program, as the titles of the papers to be presented are of unusual interest.

The annual meeting of the Ophthalmological Society of the United Kingdom was held on April 29-30 and May 1st. Two of the principal papers discussed were "Diabetes in Relation to Diseases of the Eye," and "The Prevention and Treatment of Ophthalmia Neonatorum."

At the regular meeting of the Chicago Ophthalmological Society April 19th, 1920, papers were read by Dr. Oscar Cleff on "Cyst of the Iris," and by Dr. George F. Suker, on "A Simple yet Effective Muscle Shortening for Strabismus."

The Oxford Ophthalmological Congress will assemble at Keble College, Oxford, England, on the evening of Wednesday, July 14th and will continue over Thursday and Friday following. Dr. Luther C. Peter of Philadelphia will open a discussion on "Perimetric Methods." The Doyle Memorial Lecture will be delivered by F. Richardson Cross, Esquire, J.P., L.L.D., F.R.C.S., the subject being "The Nerve Paths and Centers Concerned with Vision."

Miscellaneous.

Thirty cases of poisoning and two deaths, supposed to be the result of canned salmon, have occurred in a New York prison. Partial blindness was one of the symptoms.

The New York Post-Graduate School is conducting a campaign for a large endowment, a part of which is to enlarge the Department of Ophthalmology both in the teaching and hospital sections.

The first volume of the medical history of the world war, which deals with the hospitals of the United States, and was written by Dr. Casey Wood, is now completed and ready for the press. The entire history will comprise about twenty volumes.

The Journal of Ophthalmology, Otology and Laryngology, edited by Dr. G. W. Mackenzie of Philadelphia, has resumed publication after a number of months' suspension during the war. This journal is the official organ of the American Homeopathic Ophthalmological, Otological and Laryngolical Society.

A new edition of Dr. L. Webster Fox's "A Practical Treatise on Ophthalmology" has just been published. The book contains six colored plates and three hundred illustrations. All sections of the book practically, have been revised, and the new points in diagnosis and methods of treatment have brought the work up to date in every detail.

The Permanent Blind Relief War Fund has been aiding the blinded soldiers and sailors of the Allies since 1916 and has given one hundred thousand dollars toward the rehabilitation of our own boys through the Red Cross Institute for the Blind at Baltimore. It cannot stop now, like many war organizations, because there remain between one and two thousand blinded soldiers in France, over one thousand in Italy and hundreds in the occupied countries, such as Belgium, Serbia, Rumania and Poland, who still must be cared for. The Fund has been incorporated with a view to insuring its permanency and rendering it self-sustaining through the income of annual membership subscriptions. Associate membership is ten dollars, membership twenty-five dollars, sustaining member one hundred, life member five hundred, patron one thousand and benefactor five thousand. Charles L. Hutchinson is the treasurer, 1502 Monadnock Block, Chicago.

OPHTHALMIC LITERATURE

These lists contain the titles of all papers bearing on Ophthalmology received within the preceeding month. These titles are all in English, some of them modified to indicate more clearly their subjects. These subjects are grouped under appropriate heads the succession of groups being the same from month to month. In the group the papers are arranged alphabetically usually by the name of the author in heavy-face type. After the subject of the paper (Ill.) indicates the number of illustrations. (Pl.) the number of plates, and (Col. pl.) colored plates illustrating the article. (Abst.) shows that it is an abstract of the original article. (Bibl.) tells that the paper is accompanied by an important bibliography. (Dis.) means that discussion of the subject is published with it. Under Repeated Titles are indicated additional publication of papers already noticed. To secure the earliest possible notice writers may send copies of their papers, or reprints, to 318 Majestic Bldg., Denver, Colo.

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Clapp, C. A. Diagnosis of Arteriosclerosis from Ocular Standpoint. Med. Rev. of Rev., v. 26, p. 147.

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Peter, L. C. Value and Limitations of Perimetric Methods of Study. Amer. Jour. Physiol. Optics, v. 1, Jan., 1920, p. 56-66.

Vogt, A. Focal Illumination. Münch. med. Woch., v. 66, p. 1369.

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Heimann, E. A. Use of Sprays in Ocular Disease. Therap. d. Gegenw., v. 60, p. 459.

Hochgurtel, M. General Intoxication after Instillation of Atropin. Zeit. f. Augenh., v. 41, p. 227. Abst. Clin. Opht., v. 24, p. 36.

Levin, L. Technic of Radium Application in Cataracts. Amer. Jour. Radiol., v. 7, p. 109.

Parenteral Injection of Milk in Eye Diseases. Rev. de Med. y Cirug. Prac., v. 125, p. 329.

Possek. Poultices in Ocular Disease. Abst. Clin. Opht., v. 24, p. 89.

Schorn. Collargol in Ophthalmology. Deut. med. Woch., 1919, No. 30. Clin. Opht., v. 24, p. 42.

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Szily, P. v. and Steinberg, A. Bacteriotherapy and Chemotherapy in Ocular Disease. Klin. M. f. Augenh., Feb., 1919. Abst. Arch d'Opht., v. 37, p. 181.

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Lawford, J. B. Method of Iridotomy. Brit. Jour. Ophth., v. 4, p. 199.

Nadal, R. Bandage after Wounds and Operations. (1 ill.) Anales de la Soc. Mex. de Oft. y Oto-Rino-Lar., Feb., 1920, p. 38.

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Fehr. Testing Eyes for Glasses. Therap.. der Gegenw., v. 60, p. 416.

Gonzalez, J. Presbyopic or Adynamic Astigmatism. Med. Ibera, v. 9, p. 186.

Gould, G. M. Eyestrain in Relation to Occupations. Amer. Jour. Physiol. Optics, v. 1, Jan., 1920, p. 15-40.

Jackson, E. Changes in Refraction with Age. Amer. Jour. Ophth., v. 3, p. 228.

Jones, E. L. Disturbances of Heart and Liver with Low Grades of Astigmatism. Tr. Amer. Acad. Ophth. and Oto-Laryngol. 1919, p. 209.

Newcomb, J. R., and Larkin, B. J. Effect on Accommodation Produced by Cycloplegics in General Use. Tr. Amer. Acad. Ophth. and Oto-Laryngol. 1919, p. 179-197.

Woodruff, F. E. Determination of Axis in Astigmatism. (Dis.) Amer. Jour. Ophth., v. 3, p. 222-224.

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Llewellyn, T. L. and Elworthy, H. S. Illumination of Mines with Particular Reference to Miners' Nystagmus. Brit. Jour. Ophth., v. 4, p. 155-187, and 189.

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Buxton, L. H. Observations on Trachoma. (Dis.) Amer. Jour. Ophth., v. 3, p. 217.

Gallenga, G. Vascular Alterations in Pterygium. Ann. di Ottal., v. 25. Abst. Arch. d'Opht., v. 37, p. 189.

Guiral, R. Treatment of Trachoma. Rev. de Med. y Cirug., v. 24, p. 535. Abst. Jour. A. M. A., v. 74, p. 1135.

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